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Outcomes of assistive technology services in a community based organization

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Doctoral Project

OUTCOMES OF ASSISTIVE TECHNOLOGY SERVICES IN A COMMUNITY BASED ORGANIZATION

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OUTCOMES OF ASSISTIVE TECHNOLOGY SERVICES

IN A COMMUNITY BASED ORGANIZATION

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ABSTRACT

Assistive technology (AT) is defined as "any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (Assistive Technology Act amendments, 2004). The field of AT and AT services is dynamic and supported by multiple professions, and may be delivered in a variety of settings and contexts (Cook & Polgar, 2015). While this shared stake in the field of AT provides a variety of unique perspectives, it creates a challenge for uniformity when delivering and measuring the effectiveness and impact of services.

This project titled, *Outcomes of Assistive Technology Services in a Community Based Organization*, will seek to develop a comprehensive service delivery and outcome measurement system that is grounded in theory and informed by the evidence. Several theoretical frameworks, including Model of Human Occupation (Kielhofner, 2009), the Person Environment Occupation model (Law, Cooper, Strong, Stewart, Rigby, & Letts, 1996), the Human, Activity, Assistive Technology Model (Cook & Polgar, 2015), and the Adult Learning Theory (Knowles, Holton and Swanson, 1998) are used as a basis for structuring the program. Although the available evidence for AT interventions and

services is limited, the literature was comprehensively searched and the best evidence was selected to inform the designing of this program. Best practices were identified for assessment, intervention, and outcomes measurement. Strategies for staff development are identified, and a plan for funding, implementing and disseminating project findings is outlined.

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LIST OF ABBREVIATIONS

AAC ..... Augmentative and Alternative Communication

ADL ..... Activities of Daily Living

AOTA ..... American Occupational Therapy Association

AT ..... Assistive Technology

ATIA ..... Assistive Technology Industry Association

COPM ..... Canadian Occupational Performance Measure

COTA ..... Certified Occupational Therapy Assistant

EFPT ..... Executive Function Performance Test

ESMA ..... Easter Seals Massachusetts

FEAT ..... Functional Evaluation for Assistive Technology

GAS ..... Goal Attainment Scale

HAAT ..... Human, Activity, Assistive Technology

IADL ..... Instrumental Activities of Daily Living

ICF ..... International Classification of Functioning, Disability and Health

MassMATCH ..... Massachusetts Maximize Assistive Technology in Consumer's Hands

MOHO ..... Model of Human Occupation

MPT ..... Matching Person and Technology

MRC ..... Massachusetts Rehabilitation Commission

OT ..... Occupational Therapy/Occupational Therapist

OTPF ..... Occupational Therapy Practice Framework

PAR ..... Protocol for Accommodations in Reading

PEO ..... Person, Environment, Occupation

SETT ..... Student Environment, Task and Tools

SLP ..... Speech and Language Pathologist

SLPA ..... Speech and Language Pathology Assistant

TBI ..... Traumatic Brain Injury

TMQ ..... Time Management Questionnaire

VR ..... Vocational Rehabilitation

VRC ..... Vocational Rehabilitation Counselor

WATI ..... Wisconsin Assistive Technology Initiative

CHAPTER 1: INTRODUCTION

Nature of the Problem

An individual with a disability may experience obstacles when participating in activities that are meaningful to them. For example, a college student who sustained a traumatic brain injury (TBI) may experience several obstacles when returning to school. This student may have difficulty attending to the instructor in class, organizing ideas for compositions, typing responses to an online discussion group, handwriting notes, and keeping track of assignments (LoPresti, Simpson, Kirsch, Schreckenghost & Hayashi, 2008). An assistive technology specialist can develop an understanding of the client, identify meaningful roles and activities, and interpret the contexts in which these activities must be performed. This information can allow the practitioner to suggest an appropriate assistive technology solution to improve independence in valued roles.

Assistive technology (AT) is defined as "any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (Assistive Technology Act amendments, 2004). The field of AT and AT services is dynamic and supported by multiple professions including occupational therapy, special education, engineering, computer science, speech and language pathology, physical therapy, and rehabilitation counseling. AT services may be delivered in a variety of settings and contexts, including primary and secondary schools, vocational environments, independent living settings, and clinical treatment environments (Cook & Polgar, 2015). While this shared stake in the field of AT provides a variety of unique perspectives, it

creates a challenge for uniformity when delivering and measuring the effectiveness and impact of services.

This project titled, *Outcomes of Assistive Technology Services in a Community Based Organization*, will seek to develop a comprehensive service delivery and outcome measurement system that is grounded in theory and informed by the evidence. This system will track procedures, performance outcomes and client experiences for vocational rehabilitation clients who are referred to Easter Seals Massachusetts for AT services.

Easter Seals Massachusetts is a community-based nonprofit organization that provides services to adults and children with disabilities across the state of Massachusetts. Easter Seals Massachusetts receives referrals for AT assessment and consultation from local state vocational rehabilitation services, public K–12 school districts, state agencies for employee ergonomic evaluations, state funded waiver-based community support and transition programs, three of the five regions of the Massachusetts Assistive Technology Independent Living program, and vocational rehabilitation agencies of surrounding states (Easter Seals Massachusetts, n.d. a.).

Easter Seals Massachusetts employs an interprofessional team of 17 full-time equivalent AT specialists; and provides consultation on a fee-for-service basis through competitive contracts. Smaller contracts with school districts and facilities are negotiated every 1–2 years. Larger contracts through the state are awarded through a competitive bid process and require reapplication everyone 2–4 years. Although the contracts for AT services are competitive and closely monitored by referring agencies, few program

outcomes are monitored in a comprehensive way. Easter Seals Massachusetts monitors several outcomes essential for business operations including number of hours of services provided, number of clients reached, and cost of equipment purchased. It has deliberately collected testimonials and client vignettes which provides anecdotal evidence for quality and effectiveness of services provided. Personal stories can be a powerful means for influencing perspectives, as this was an important strategy for changing perspectives of lawmakers when lobbying for the passage of the Americans with Disabilities Act of 1990 (Switzer, 2003). However, vignettes are not an effective means to understand if a program and service delivery system is effective for all service recipients. Current systems for monitoring the quality and effectiveness of all services provided are inconsistent throughout the programs.

Approach to Address the Problem

This doctoral project aims to develop a model by which Easter Seals Massachusetts and other similar community based organizations can structure their assessment procedures, interventions, and outcomes measurement as it relates to assistive technology services. Locally, information collected through a comprehensive program evaluation can be used by Easter Seals Massachusetts to monitor organizational performance, maintain appropriate staffing levels, provide insight into employee training priorities, and identify problems with current program procedures. This information can also highlight functional improvements of clients being served, identify outcomes for clients receiving services, and justify the monetary costs for services. Analysis results will be extremely useful not only for the organization staff members, but for the clients

served, referring agencies, and potential organization donors as well.

There is a potential global impact outside of the Easter Seals Massachusetts organization that can be made as a result of this project. Outcomes inform administrators, legislators, practitioners and members of the public for making referral, program development, and funding decisions (Smith, 1996; Newcomer, Hatry & Wholey, 2010; Mendelsohn, Edyburn, Rust, Schwanke & Smith, 2008). This doctoral project aims to meet its objectives by systematically reviewing the literature in AT and similar fields, identifying best practices in outcomes assessment and analysis, developing a realistic implementation plan, identifying a method by which to evaluate program implementation, and determining best methods for disseminating findings.

Challenges in Addressing this Problem

The Assistive Technology evidence-based literature has clearly identified that there is a dearth of quality evidence related to best practices for assessment, intervention and outcomes measurement (Smith, 1996; Lenker & Paquet, 2004; Martin, Kelly, Kernohan, McCreight, & Nugent, 2008; Anttila, Samuelsson, Salminen, & Brandt, 2012; Thomas, Barker, Rubin, & Dahlmann-Noor, 2015). Three recent systematic reviews could not find a sufficient number of high quality research studies to draw meaningful conclusions about assistive technology intervention (Martin, et al., 2009; Anttila, et al., 2012; Thomas, et al., 2015). Two of these articles were Cochrane Reviews in which none of the studies met the rigorous inclusion criteria for consideration (Martin, et al., 2009; Thomas, et al., 2015). Difficulty in monitoring outcomes in AT is a well-documented problem. Smith (1996) describes that significant challenges exist in

selecting and considering outcomes to describe the effectiveness of AT services. Lenker and Paquet (2004) identify that currently no models exist for predicting successful AT usage.

A comprehensive search for literature using PubMed, CINHAL and ERIC databases yielded only 15 intervention studies involving assistive technology. Seven of these studies were either case series or enrolled fewer than 10 participants, reducing the overall strength of the results (LoPresti, et al., 2008; Moir, 2010; Burke, et al., 2013; Floyd & Judge, 2012; Harvey, Hux, Scott, & Snell, 2013a; Harvey, Hux, & Snell, 2013b; Sohlberg, Fickas, Ehlhardt, & Todis, 2005). This doctoral project has reviewed existing literature to establish program recommendations based on the best evidence available.

Assistive Technology Services as Occupational Therapy

The American Occupational Therapy Association's (AOTA) Occupational Therapy Practice Framework (OTPF) defines occupational therapy (OT) as the "therapeutic use of everyday life activities (occupations) with individuals or groups for the purpose of enhancing or enabling participation in roles, habits, and routines in home, school, workplace, community, and other settings," (American Occupational Therapy Association, 2014, pp. 1). This definition of OT complements the services provided by Easter Seals Massachusetts. The mission of Easter Seals Massachusetts is to provide "exceptional services, education, outreach, and advocacy so that people living with disabilities can live, learn, work and play in our communities," (Easter Seals Massachusetts, n.d., pp. 1). This organization's mission, and assistive technology services, embodies the core values of the occupational therapy profession.

Assistive technology assessment, selection, provision, education and training is specifically described in the OTPF as a preparatory method to support independence and success in performing meaningful activities (American Occupational Therapy Association, 2014, pp. 29). The scope of meaningful occupations described by the OTPF is consistent with the collaborative and self-selected vocational goals and activities that are identified by the client's vocational rehabilitation counselors. These activities often include gainful employment, enriching volunteer experiences, vocational training programs, and post-secondary education. Occupational therapy practitioners possess the values, perspectives and skills necessary to provide quality assistive technology services—OTs can evaluate and address client factors, performance skills, process skills, performance patterns, contexts, and environments that may impact an individual's ability to engage in meaningful activity (American Occupational Therapy Association, 2014). Once these factors are understood, a variety of supports, which may include assistive technology, may be selected, trialed and implemented to promote independence and success in occupational performance. An OT practitioner can play an active role in the selection and implementation process, including funding, procurement, installation, modification, training the client, training the caregivers, and modifying the environment to support success.

Assistive Technology service delivery is an approach that is shared by multiple professionals including occupational therapists, speech and language pathologists, physical therapists, rehabilitation engineers, special educators, rehabilitation counselors, and individuals with lived experience (Cook & Polgar, 2015). Practitioner specialization

within the field of AT may be influenced by professional background, and professional background may influence the AT services provided.

This author is certified as an Assistive Technology Professional (ATP) through the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA). To address quality and standards that may differ across professions, RESNA publishes *Assistive Technology Service Delivery Standards of Practice* and a *Code of Ethics* (RESNA, n.d. a). In order to best address client needs in all circumstances and practice settings, Easter Seals Massachusetts employs a diverse team of assistive technology specialists with clinical backgrounds in occupational therapy, speech and language pathology, special education, engineering, and computer science, as well as individuals with lived experiences.

Theoretical frameworks from the fields of OT, AT and adult learning were identified to shape and guide this project. Further, the peer-reviewed literature was search to determine best practice standards and recommendations.

CHAPTER 2: THEORETICAL AND EVIDENCE BASE

Theoretical and Conceptual Frameworks

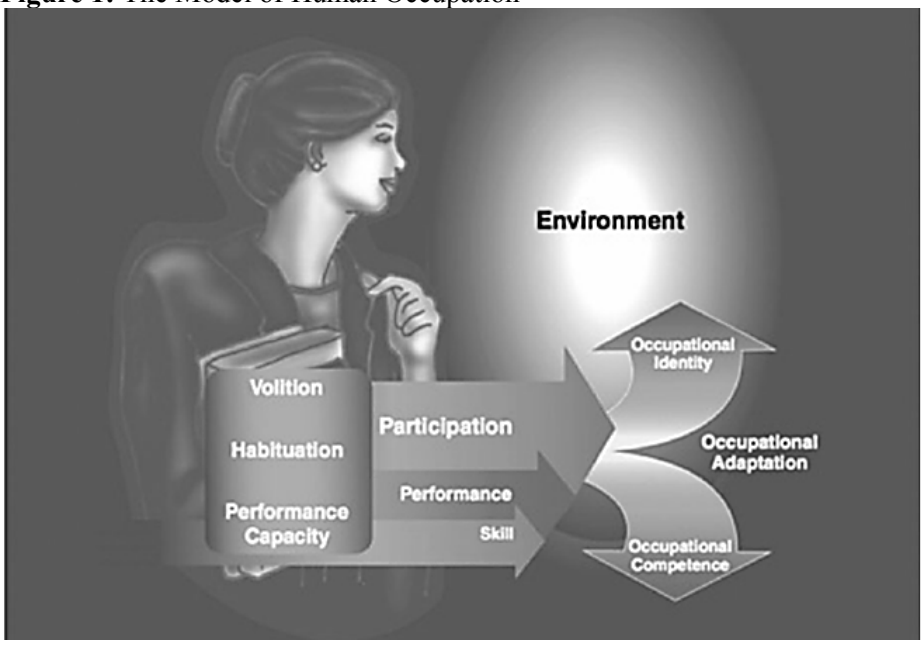
Several theories are utilized to support the assessment for, training of and use of assistive technologies by individuals with disabilities for meeting vocational, educational and independent living goals. These theories include the Model of Human Occupation (Kielhofner, 2009), the Person Environment Occupation model (Law, Cooper, Strong, Stewart, Rigby, & Letts, 1996), the Human, Activity, Assistive Technology Model (Cook & Polgar, 2015), and the Adult Learning Theory (Knowles et al., 1998).

The Model of Human Occupation (MOHO) theory describes that an individual's characteristics are interconnected with the external environment, and engagement in occupation is influenced by these individual and environmental factors. Further, an individual's characteristics can be maintained or modified by engaging in occupation (Kielhofner, 2009). The MOHO theory breaks down an individual's characteristics into volition, habituation, and performance capacity. Volition is an internal human desire to engage in meaningful activity, which can be influenced by life experiences. Habituation is a process by which people organize performance intervals and routines. Performance capacity describes the internal client factors, such as physical and cognitive abilities, sensory processing capacity, and overall ability to perform essential functions (Kielhofner, 2009).

The MOHO theory supports using assistive technology (AT) to help individuals with disabilities meet their vocational goals and further develop their occupational identity. The MOHO theory describes that humans are occupational beings that seek to

develop occupational competence (Kielhofner, 2009). Successful participation in life roles and development of occupational competence can lead to improved self-efficacy and life satisfaction (Kielhofner, 2009). The MOHO provides a client-centered process and encourages the use of therapeutic strategies such as validating, providing feedback, structuring choices, coaching, encouraging, and provision of physical support (Kielhofner, 2009). These are strategies that the clinical staff in the assistive technology consultation program at Easter Seals Massachusetts regularly engage in an effort to support clients. The interaction of these influencing factors can be seen in Figure 1.

Figure 1: The Model of Human Occupation



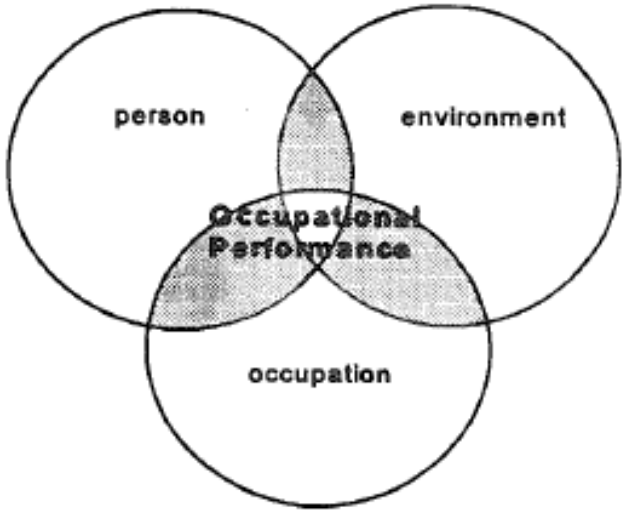
(Kielhofner, 2009, p 149)

The MOHO can be used to describe the AT consultation program at Easter Seals. The individuals being served by this assistive technology program at Easter Seals are currently receiving vocational rehabilitation services, and were referred to the AT

program by the state vocational rehabilitation agency. In order to qualify for state vocational rehabilitation services, the individual must have a diminished performance capacity that impacts their participation in attaining meaningful employment. Individuals must have self-referred or been referred to vocational rehabilitation services, emphasizing the personal importance of employment or student roles and habituation. In order to have been referred for an AT consultation, the client must have been found to have volition to pursue vocation and education goals. Throughout the evaluation process, the assistive technology program will attempt to determine if assistive technology will be an appropriate environmental factor to support successful participation in these meaningful occupations.

The Person–Environment–Occupation (PEO) model describes that the person is a unique being that may be influenced, supported, or negatively impacted by the environment when engaging in activity, tasks or occupations that are meaningful to them (Law et al., 1996). This model describes a person as dynamic, and possesses the ability to change through intervention and influence. The PEO model describes the environment as a construct that can influence the individual and be influenced by the individual. The model describes occupations as activities and tasks that are accomplished to fulfill a purpose. The fit of these three constructs, as depicted in Figure 2, may change over time, and may impact the outcome of successful occupational performance (Law et al., 1996).

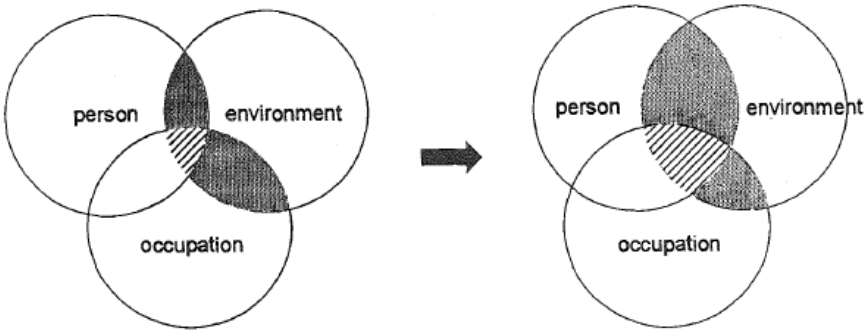
Figure 2: The PEO model



(Law et al., 1996, p. 19)

The PEO model describes that tools, such as assistive technologies, are part of the dynamic environmental factors that can support an individual's engagement in meaningful occupation and a positive outcome of successful occupational performance. This model describes that assessment and consideration of environmental characteristics is as important as assessment and consideration of an individual's characteristics and capacities (Law et al, 1996). If an individual's environment were modified through the use of assistive technology, as depicted in Figure 3, it may improve an individual's ability to engage in an occupation, and improve overall occupational performance (Law et al., 1996).

Figure 3: Modifying the environment in the PEO model



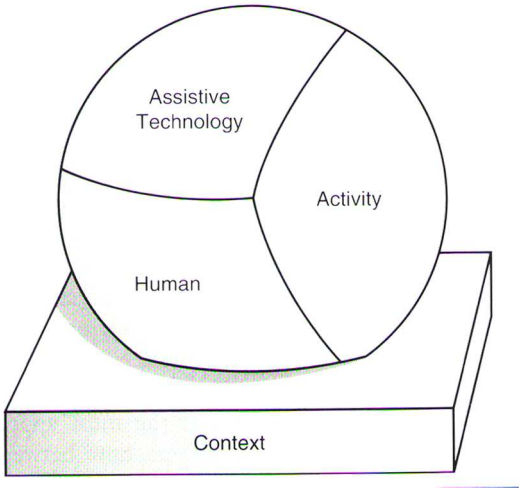
(Law et al., 1996, p. 18)

Although the MOHO and PEO models provide a solid theoretical foundation for the assistive technology services provided through our program, these models utilize biases, concepts, and terminology that are greatly influenced by an occupation-based Occupational Therapy (OT) approach (Kielhofner, 2009: Law et al., 1996). There is concern that successful conceptualization and implementation of these theoretical models may be limited with a staff made up of specialists from a variety of professional backgrounds. It is important to utilize theoretical models that can be understood and appreciated by the special educators, speech and language pathologists, rehabilitation counselors, technologists, and rehabilitation engineers on our staff.

The Human, Activity, Assistive Technology (HAAT) model is an interdisciplinary practice model that emphasizes the close and dynamic interaction between the human and their client factors, a meaningful activity and it's task demands, the assistive technology tools selected and the influence of the context (Cook & Polgar, 2015). The human component, similar to that of the human component in MOHO and person component in PEO, includes an individual's motor, sensory, cognitive, and

psychosocial capacities (Kielhofner, 2008: Law et al., 1996; Cook & Polgar, 2015). The activity component represents tasks that the individual needs to, wants to, or is expected to engage in. The assistive technology component examines the selected AT device, how the human interacts with the technology, how the technology interacts with the environment, and what the activity output is (Cook & Polgar, 2015). These components are influenced by physical, social, cultural, and institutional contexts (Cook & Polgar, 2015). The interaction of these factors can be seen in Figure 4.

Figure 4: The Human, Activity, Assistive Technology Model



(Cook & Polgar, 2015, p. 7)

Cook and Polgar describe elements of context in great detail (2015). The physical context may include physical features that can promote or impede participation in a valued activity. For example, tactile or braille markers on room signs may allow an individual with a visual impairment to navigate a new environment with greater independence. The social context can involve social factors that may influence an individual's ability to engage in an activity. For example, a barista may not be able to

understand an individual with moderate dysarthria when they're attempting to order a beverage in a noisy coffee shop. Cultural context may involve cultural beliefs connected with the individual's ethnic or religious groups, social group, or local community. For example, a college student may be unwilling to utilize a conventional digital recorder in lecture because they may feel they will be judged by peers. This student may be more willing to utilize a ballpoint pen with digital recorder built-in, because it is more discrete than the conventional digital voice recorder. Finally, institutional context describes legislation and regulations that may impact performance, and policies and funding that may support the use of assistive technologies. For example, The Assistive Technology Act Amendments of 2004 provided funding for local technology lending centers so individuals can borrow and trial assistive technology devices prior to seeking funding (Assistive Technology Act amendments, 2004). These contexts may influence the human factors, activity factors, in the assistive technology factors (Cook & Polgar, 2015).

The HAAT Model has similar components to other ecological models such as the PEO model and MOHO theory, as they all consider the influence of multiple factors on occupational performance (Cook & Polgar, 2015). While the PEO model and MOHO theory incorporate assistive technology into the environmental domains (Kielhofner, 2008: Law et al., 1996), the HAAT Model allows the assistive technology professional to consider the specific factors of the assistive technology and how human factors, activity factors and contextual factors may impact it's success (Cook & Polgar, 2015). For example, an individual who was working as an accountant is having trouble using the mouse and keyboard on their computer due to her progressive neuromuscular medical

condition. While this individual has had great success utilizing speech recognition for responding to emails, it is difficult for them to use speech recognition technology to manipulate formulas and navigate spreadsheets that are essential to their occupation as an accountant. This represents a disconnect between the assistive technology chosen and the activity that it is needed for (Cook & Polgar, 2015).

Once the appropriate assistive technology and environmental supports are identified and put into place, the individual must be trained in strategies and skills for effectively utilizing the assistive technology (Cook & Polgar, 2015). Adult learning theory describes a set of core values that are necessary when attempting to facilitate learning for an adult population (Knowles et al., 1998). Knowles et al. (1998) acknowledges that there is no single model or theory that can explain all of human learning, but several frameworks and theories can be utilized to facilitate optimal learning for the majority of individuals. Eduard Lindeman, an American adult educator, identified key concepts unique to the majority of adult learners in the 1920s, which can be seen in figure 5 (Knowles et al., 1998).

Figure 5: Five conclusions of adult learning from Eduard Lindeman

1. Adults are motivated to learn as they experience needs and interests that learning will satisfy; therefore, these are the appropriate starting points for organizing adult learning activities.
2. Adults' orientation to learning is life-centered; therefore, the appropriate units for organizing adult learning are life situations, not subjects.
3. Experience is the richest resource for adults' learning; therefore, the core methodology of adult education is the analysis of experience.
4. Adults have a deep need to be self-directing; therefore, the role of the teacher is to engage in a process of mutual inquiry with them rather than to transmit his or her knowledge to them and then evaluate their conformity to it.
5. Individual differences among people increase with age; therefore, adult education must make optimal provision for differences in style, time, place, and pace of learning.

(Knowles et al., 1998, pp. 22)

Education interventions should utilize the above concepts as a guide to accommodate for the unique needs and characteristics of adult learners. Educational activities should be motivating, support life-centered orientation to learning, be relevant to the client, tap into prior skills, and should acknowledge and respect individual differences (Knowles et al., 1998). For example, training activities should involve the client's actual work when available and appropriate. If learning to use a cognitive aid for daily living, it is best to use a client's own assignment due dates and important meetings. The client may not be as engaged if learning the operating procedures with a neutral practice activity. Identifying similarities of the cognitive aid to daily living with other effective strategies they may have used in the past may also improve learning.

Evidence Base for Assistive Technology Services

Despite its rapid development as an interprofessional field, the evidence-based literature related to assistive technology assessment, intervention and outcome measurement have failed to provide definitive evidence regarding best practices. Due to its numerous practice areas, multiple service delivery contexts, varied practitioner theoretical perspectives, and funding challenges, literature related to assistive technology intervention has been described as lacking rigor, having low enrollment, and have limitations in consistent measurement (Smith, 1996; Lenker & Paquet, 2004; Martin, et al., 2008; Anttila, et al., 2012; Thomas, et al., 2015). This review of the literature has selected the best available evidence through searches on PubMed, CINAHL and ERIC databases.

Comprehensive Assistive Technology Assessment

Numerous structured assessments have been published to assist with the appropriate selection of assistive technologies for specific populations, including the Matching Person and Technology (MPT) Scale, the Functional Evaluation for Assistive Technology (FEAT), the Student Environment, Task and Tools (SETT) Framework, and the Wisconsin Assistive Technology Initiative (WATI) Assistive Technology Assessment. Each of these assessments was reviewed in detail.

The MPT assessment process is a series of measures designed to assess for AT use by individuals with disabilities in work, school and home environments. This scale considers essential client factors such as motor and cognitive performance, social factors such as family and caregiver supports, and cultural factors such as comfort with and

predispositions about technology (Scherer, 2007). The *MPT Assessment and Process Manual* contains nine forms that can be selected for use during an assistive technology assessment, including an initial worksheet, a *History of Support Use* form documenting prior assistive technology and caregiver supports utilized by an individual, a *Survey of Technology Use* documenting history of technology use by a client, an *Assistive Technology Predisposition Assessment* for clients and professionals, an *Educational Device Predisposition Assessment*, a *Workplace Device Predisposition Assessment*, and a *Healthcare Technology Predisposition Assessment* (Scherer, 2007). The manual anticipates that an experienced evaluator can complete the comprehensive battery in 50 minutes, and specific measures may be completed in 15 minutes (Scherer, 2007).

The FEAT is an assistive technology Assessment designed to assess assistive technology needs for individuals with disabilities who are in learning and educational contexts. The assessment contains checklists for documenting competence in writing, reading, organization, and mathematics by client self-report. Further, the assessment evaluates environments and provides specific suggestions for equipment to trial and utilize (Raskind & Bryant, 2002). The FEAT is designed for assessing individuals with educational goals, and cannot evaluate potential assistive technology users in work or home environments. This instrument collects only descriptive qualitative data, and specific assistive technology category and item recommendations are outdated due to the measure not being updated since 2002 (Raskind & Bryant, 2002).

The FEAT examiner's manual reveals results of internal consistency and test-retest reliability studies that were performed by the authors. It also describes the test

development process to justify the measure's validity (Raskind & Bryant, 2002). No peer reviewed studies were found to support the reliability and validity of the FEAT.

The SETT Framework is a collection of surveys and checklists that assists education teams in organizing information and gathering data to make collaborative decisions about using assistive technology for students in primary and secondary schools. The SETT framework looks at all the tools available to assist a student with a disability, including technology related tools as well as classroom accommodations and supports, to promote success (Zabala, 1995).

The SETT framework is available for download and use for free, and is well regarded in the special education and education-based assistive technology fields. The SETT framework theoretical perspective is recommended for adoption by public schools statewide by the Virginia Department of Education (2008) and Iowa Department of Education (2015). Despite its widespread use, no peer-reviewed account exists and there is no validity or reliability data for this assessment and theoretical perspective.

The WATI Assessment is a comprehensive function based battery of surveys designed to understand performance skills and barriers for students in primary and secondary learning environments (Gierach, 2009). The worksheets of the WATI Assessment include detailed data collection forms related to demographic information, fine motor skills related to keyboarding and writing, cognitive and executive function impact on student roles, communication, reading, studying, math, recreation and leisure, seating and positioning, mobility, vision, and hearing. The assessment also contains an environment observation guide specific to classroom environments, as well as grids and

diagrams to assist with assistive technology decision making (Gierach, 2009).

Although reliability and validity studies were not available for the WATI Assessment, a study assessing switch use in children found that sections of the WATI Assessment were sensitive to understanding performance skills in children with multiple disabilities (Hoppenbrouwers, Stewart, & Kernot, 2014).

Three of the four comprehensive assistive technology assessments found, the FEAT, the SETT Framework and the WATI Assessment, focus exclusively on assessing for assistive technology in learning environments (Raskind & Bryant, 2002; Zabala, 1995; Gierach, 2009). Two of the assessments, the SETT Framework and WATI Assessment, focus primarily on primary and secondary education settings (Zabala, 1995; Gierach, 2009). Only the MPT is designed to assess for assistive technology in education, vocational, and independent living contexts (Scherer, et al., 2005). Although the MPT allowed for collection of qualitative data regarding the user's disposition for the technology, this assessment did not gather any performance based quantitative data that can be used to track progress or changes in performance ability (Scherer, et al., 2005).

Several assessment measures that address specific skills capacities were found. The Time Management Questionnaire (TMQ) is an assessment that can measure time management skills and strategies for adult students. This questionnaire has 18 items that the subject will rate on a scale of 1–5, resulting in a minimal score of 18 and maximal score of 90 (Britton & Tesser, 1991). The Executive Function Performance Test (EFPT) is a measure that examines executive functions, such as initiation, execution, organization, sequencing, judgment and completion, while the individual is performing a

task. This measure has the client complete four tasks, including simple meal prep, medication management, finance management, and communication (Baum & Wolf, 2013). The Protocol for Accommodations and Reading (PAR) is an assessment that measures and compares reading speed and comprehension when utilizing an accommodation such as read aloud or assistive technology (DeCoste & Wilson, 2014).

Interprofessional Assistive Technology Service Delivery

Several factors impact the availability of quality evidence regarding assistive technology intervention best practices. Primarily, meaningful outcomes of assistive technology intervention can vary greatly depending on the individual, the activity and the context in which they are using the technology (Smith, 1996; Anttila, et al., 2012). There is high level of variability in client factors, roles, expectations, cultural factors and contexts in naturally existing groups of individuals who use assistive technologies. When variables are controlled for, it is difficult to generalize results to diverse individuals in practice (Smith, 1996). Because of technology advances and changing roles and activities for all individuals, outcomes for assistive technology can be considered "moving targets" that change frequently over time, making it difficult to standardize in a study (Andrich, Caracciolo, & Johnson, 2013; Anttila, et al., 2012).

Several studies support the use of specific assistive technologies. Use of assistive technology as a cognitive aid to daily living was found to be effective for recalling events and tasks for individuals with cognitive impairment (Gentry, 2008; LoPresti, et al., 2008; Lindqvist, Larsson & Borell, 2015), and young adults with Autism who experience limitations in executive function (Gentry, Wallace, Kvarfordt, & Lynch, 2010; Gentry,

Kriner, Sima, McDonough, & Wehman, 2015). These studies paired assistive technology training with provision of electronic devices that possess visual and auditory prompts for digital calendar events and tasks for the subjects. These studies varied greatly as case series or case study design (LoPresti, et al., 2008), small controlled pre/post analyses with twenty or fewer participants (Gentry, 2008; Lindqvist, et al., 2015), and larger quasi-experimental or delayed random controlled trials with more than 20 participants (Gentry, et al., 2010; Gentry, et al., 2015). All five of these studies reported positive outcomes from using electronic cognitive aids (Gentry, 2008; Gentry, et al., 2010; Gentry, et al., 2015; LoPresti, et al., 2008; Lindqvist, et al., 2015).

Several studies found that the use of synthesized text-to-speech screen reading assistive technologies improved reading rate for individuals with learning disabilities (Floyd and Judge, 2012) and for adults with brain injury (Harvey, et al., 2013a; Harvey, et al., 2013b). These studies were inconclusive for the impact of synthesized text-to-speech screen reading technologies on reading comprehension, though all the studies reviewed were limited by small sample size and high level of variability among study participants (Floyd and Judge, 2012; Harvey, et al., 2013a; Harvey, et al., 2013b).

Some studies found assistive technology devices and training to be effective for specific groups of individuals or for certain activities. Burke et al. (2013) reported tablet-based video modeling was a helpful job-related support for 4 adults with Autism who acquired new employment. Sohlberg et al. (2005) reported that providing assistive technology, Internet access and in-home training was effective for developing new skills and improving online social connectedness of 4 adult individuals who had a history of

moderate to severe brain injury. A study of 18 young adults with a mean age of 13 found that provision of in-home assistive technology training helped participants meet personal goals, and improved social participation (Raghavendra, Newman, Grace, & Wood, 2013).

A major theme emerged when evaluating intervention strategies and characteristics among the reviewed studies: positive outcomes were present when there was a client centered approach. Several studies involved multiple intervention visits with the client in their own living or working environments (Burke, et al., 2013; Gentry, 2008; Gentry, et al., 2010; Gentry, et al., 2015; Harvey, et al., 2013a; Harvey, et al., 2013b; Raghavendra, et al., 2013; Sohlberg, et al., 2005). Among these studies, five described providing four or more visits for intervention (Gentry, 2008; Gentry, et al., 2010; Gentry, et al., 2015; Raghavendra, et al., 2013; Sohlberg, et al., 2005). A handful of studies were performed in a clinic or center (Desideri, et al., 2016; Floyd & Judge, 2012; LoPresti, et al., 2008), all of which had two or fewer visits. Although there were no studies directly comparing a community based assessment and intervention process to a clinic based assessment and intervention process, the positive outcomes shared by the studies that worked with clients in their living or working environments suggests that a natural context has advantages over a clinic or center when it comes to assistive technology assessment and intervention (Burke, et al., 2013; Gentry, 2008; Gentry, et al., 2010; Gentry, et al., 2015; Harvey, et al., 2013a; Harvey, et al., 2013b; Raghavendra, et al., 2013; Sohlberg, et al., 2005).

Another theme that emerged in the evidence-based literature is that active engagement of clients in the evaluation process appears to lead to better outcomes

(Lenker, & Paquet, 2004; Johnston, Currie, Drynan, Stainton, & Jongbloed, 2014; Scherer, Sax, Vanbiervliet, Cushman and Scherer, 2005). A survey of 357 adult assistive technology users in Canada found that collaboration and shared decision making between a professional and client was the most important factor in choosing and using assistive technology (Johnston, et al., 2014).

Effective Outcome Measurement in AT Service Delivery

Several instruments exist that may measure the impact of assistive technology and consultation services. Three measures were explored in detail: the Assistive Technology Predisposition Assessment in the MPT Assessment, the Canadian Occupational Performance Measure (COPM), and the Goal Attainment Scale (GAS).

The Assistive Technology Predisposition Assessment in the MPT Assessment has the potential to collect data from the client and professional on perceived device effectiveness, device usability, device frequency of use, and reasons for device use. Results can be compared using descriptive statistics, and may vary greatly depending on the client or evaluator. In a study of 150 vocational rehabilitation practitioners serving clients in 25 states, Scherer et al., found that the Matching Person and Technology assessment process enhanced practitioner understanding of the assistive technology service delivery process, and the Assistive Technology Predisposition Assessment was predictive of successful assistive technology device selection (2005). Information about the evaluators and clients in this study were unclear, and the authors recommended additional validation studies to establish validity for individuals across the life course in multiple contexts (Scherer, et al., 2005).

The COPM is a client-centered measure that attempts to detect a change in a client's self-perception of occupational performance over time. Through a semi-structured interview, an Occupational Therapist assists a client in identifying limitations in occupational performance, then has the client rank these, and rate performance and satisfaction for the five occupations that are most meaningful to them (Law et al., 2015).

Due to its client-centered nature, the COPM has the potential to meet the needs of individuals with diverse abilities, goals and contexts. Scoring and interpreting the COPM is relatively simple, and intervention effectiveness can be determined on a case-by-case basis without extensive analysis. Unfortunately, the diversity of evaluators and practitioners may present to be too great a barrier for utilizing the COPM as a reliable measure. The COPM authors emphasize that trained occupational therapists are the best practitioners for understanding and determining occupational performance limitations. The authors warn that interdisciplinary use of the COPM may extend the measure outside of the occupational performance domain, and no longer have the same validity and reliability qualities (Law et.al. 2015).

Goal Attainment Scaling (GAS) is a client centered outcome measurement system that is sensitive to change and can be utilized by an interprofessional team (Kiresuk, & Sherman, 1968). Using the GAS allows the practitioner to partner with the client to establish meaningful goals that are unique to the client. Levels of achievement for these goals are rated on a 5-point rating scale, ranging from -2 to +2 (Kiresuk, & Sherman, 1968). A systematic review of rehabilitation studies using Goal Attainment Scaling found it to be a reliable, valid, and sensitive method for assessing the achievement of

goals (Hurn, Kneebone & Cropley, 2006).

Similar to the COPM, the client-centered nature of GAS can meet the needs of individuals with diverse abilities. Further, use of GAS is not limited only to a single professional group, allowing for multiple members of the interprofessional team to utilize this tool for assessment and reassessment. The COPM and GAS are not exclusive to assistive technology, though the client-centered nature of these assessments can easily accommodate goals and objectives related to improving functioning with the support of assistive technology.

This project will draw from the foundation of theory and evidence-based literature presented to provide recommendations for improving an existing community based Assistive Technology service delivery program and its ability to effectively demonstrate objective outcomes.

CHAPTER 3: DESCRIPTION OF THE PROPOSED PROGRAM

Existing Program

This project, titled *Outcomes of Assistive Technology Services in a Community Based Organization*, seeks to measure and track procedures, outcomes and client experiences for the assistive technology consultation services that Easter Seals Massachusetts provides. Easter Seals Massachusetts is local chapter of a large national nonprofit organization that provides services so "adults and children with disabilities can live, learn work and play," (Easter Seals, n.d. b.). The assistive technology department at Easter Seals has been providing assessment, installation, modification, training, and technical support in a consultative model for variety of public and private agencies for 26 years. The largest contract is through the state vocational rehabilitation agency, the Massachusetts Rehabilitation Commission (MRC). Easter Seals receives between 40 and 70 referrals for assistive technology assessment and consultation from MRC each month. Easter Seals Massachusetts also provides AT consultation on a fee-for-service basis with public K–12 school systems, state agencies for ergonomic evaluations, vocational rehabilitation agencies of surrounding states, for a state funded waiver-based community support program, and for three of the five state regions of an Assistive Technology Independent Living program. An interprofessional team comprised of occupational therapists, rehabilitation counselors, speech and language pathologists, special educators, technology professionals, and individuals with lived experience provide the services. AT Specialists work with clients in the home, learning, work, and community environments throughout the state of Massachusetts.

The majority of communication among staff members and leadership is by telephone and through electronic communication such as email and text message. In-person meetings are scheduled as needed, and often occur 1 to 2 times per year at the organization's headquarters in central Massachusetts. In-person meetings are held as needed with individual or small groups of field staff for skills development, clinical support, and program development.

Although the vocational rehabilitation contract is competitive and is closely monitored by the chief engineer at MRC, only some program outcomes are monitored by Easter Seals Massachusetts. Data on referrals per month, timeliness of assessments and reports, and qualitative data on training activities, are collected by the clinical supervisor at Easter Seals Massachusetts. Treatment minutes are collected for each client in a network-based electronic record system, and reports are submitted monthly to referral sources for payment and reimbursement. Although service recipients in other Easter Seals Massachusetts programs receive feedback surveys after discharge, referred vocational rehabilitation clients do not receive any outcome or feedback surveys following discharge. Benchmark timelines for providing services and performing documentation tasks have been negotiated and determined between Easter Seals Massachusetts and the Assistive Technology Coordinator at MRC. See Figure 6 for details on the benchmark expectations for the assistive technology service delivery process.

Figure 6: Benchmark Expectations for Assistive Technology Consultation Processes for Vocational Rehabilitation Clients

Task	Duration Expectation
MRC Assistive Technology (AT) Coordinator reviews referral from vocational rehab counselor and sends to Easter Seals Massachusetts (ESMA) Clinical Supervisor	1–2 business days
ESMA Clinical Supervisor reviews and assigns to ESMA AT Specialist in the field	2 business days
ESMA AT Specialist contacts client and schedules evaluation appointment	2 business days
Evaluation visit completed by ESMA AT Specialist	15 business days
Evaluation report is written and submitted to ESMA administrative staff	Within 10 business days of evaluation completion
Evaluation report is reviewed and sent to MRC AT Coordinator	Within 2 business days
MRC AT Coordinator reviews report and approves requests, seeks clarification, or denies recommendations	Within 5 business days
If approved, evaluation report sent by ESMA administrative staff to vocational rehab counselor to confirm eligibility for paid services	Within 2 business days
Vocational Rehab Counselor notifies ESMA administrative staff whether client is eligible for paid services	Within 5 business days
Equipment quote is generated by ESMA administrative staff, sent to MRC Assistive Technology Coordinator	Within 7 business days
MRC AT Coordinator reviews and responds to quote	Within 5 business days
Once quote is approved, equipment is ordered by ESMA administrative staff	Within 7 business days of quote approval
Equipment delivered by ESMA AT Specialist to client	Within 30 days of quote approval
Monthly progress note completed by ESMA AT Specialist and submitted to ESMA administrative staff	Within first 7 days of new month
Discharge summary completed by ESMA AT Specialist and submitted to ESMA administrative staff	Within 5 days of last visit

When a vocational rehabilitation client needs an assistive technology consultation, their vocational rehabilitation counselor employed by MRC will submit a referral form to the AT Coordinator at MRC for initial screening, which then is submitted to the Clinical Supervisor at Easter Seals Massachusetts. This form was developed by the AT Coordinator at MRC, and cannot be modified. Please see Appendix A for details.

Currently, standardized assessment and outcomes measurement is inconsistent for the assistive technology program. Some AT Specialists utilize school based standardized evaluations and assessments such as the WATI (Gierach, 2009) and SETT (Zabala, 1995) for school based consultations. Some clinicians use measures to address specific activities or problem areas. For example, the Protocol for Accommodations in Reading (PAR) is used to compare different reading accommodations for students who have a print-related disability (DeCoste and Wilson, 2014). Repetition of measures during and following intervention is rarely performed, so it is difficult to understand if the consultation is having an impact.

Assistive Technology Specialists use a customized document template to prompt for key documentation points in writing comprehensive evaluation reports. These reports list the evaluation procedures, describe the client and their functional limitations, explain vocation and education related activities the client wants to or is expected to engage in, identifies assistive technology considered, describes results of equipment trials, and presents recommendations for assistive technology equipment installation and training. The evaluation report is thoroughly reviewed by the Assistive Technology Coordinator at MRC and the report will be either approved, questioned or denied. Purchasing for approved equipment is performed by the Easter Seals Massachusetts administrative staff once eligibility for paid services is confirmed by MRC. Please see Appendix B for the evaluation report document template created in 2012.

Assistive Technology Specialists complete a monthly progress note for each client that is intended to describe current assistive technology training activities, and progress

toward assistive technology training goals. In 2014, a new format was adopted that identified learning activities, which allowed AT Specialists to rate client performance on a scale based on the Functional Independence Measure (Uniform Data Set For Medical Rehabilitation, 1996). In this scale, a zero was selected to represent equipment installation activities, a 1 rating describes total dependence in an activity, a 2 describes maximal assistance, 3 describes moderate assistance, 4 describes minimal assistance, 5 describes supervision or setup for an activity, 6 describes modified independence with an activity, and 7 describes complete independence in the activity. The document template utilizes text boxes for entering key demographic information, and has content control drop-down menus for selecting performance ratings on the 0–7 scale. Although this documentation format provided clearer functional status updates compared to the prior narrative version of the monthly training note, there were significant inconsistencies among staff in documenting training objectives and selecting ratings. While some staff had extensive experience in physical rehabilitation and utilized FIM ratings skillfully to describe assistive technology mastery, the majority of the interprofessional staff was unfamiliar with the measure and reported difficulty in understanding the difference between the ratings. The lack of consistency among staff threatened the validity of using this rating scale. Unfortunately, the ability to understand progress and compare service participants was limited because this scale was not valid or reliable in this adapted form. Please see Appendix C for the current progress note document template.

The development of a comprehensive system of outcomes monitoring can assist Easter Seals leadership to monitor organizational performance, maintain appropriate

staffing levels, target employee training opportunities, and identify problems with program procedures. Outcome trends can be tracked and adjustments can be made to optimize the quality of services. This information can be provided to the referral sources to highlight functional improvements of clients being served, identify outcomes for clients receiving services, and to justify the monetary costs for services. If outcomes demonstrate a clear impact of assistive technology services, there is potential for dissemination via poster, conference workshop, or peer reviewed journal.

Proposed Program

The proposed project will draw from the successful components of the existing program and supplement specific areas that need improvement with modifications to promote best practices determined in the comprehensive literature review. Specifically, we plan to 1) revise the intake and tracking protocols, 2) implement changes to the evaluation procedures, 3) incorporate regular use of outcome measures, 4) promote use intervention strategies grounded in theory and supported by evidence, and 5) integrate routine program evaluation through analysis of outcome data and quality assurance surveys.

Revise Intake and Tracking Protocols

When a vocational rehabilitation counselor refers a client to Easter Seals for assistive technology consultation, they complete the Request for Adaptive Assistance form and submit this to the MRC Assistive Technology Coordinator. This form, that was revised in June 2011, was created and maintained by the AT coordinator and the MRC's central office. It is used for referring clients to a number of agencies. It allows for the

collection of key demographic and descriptive information, such as date of birth, address, program eligibility, primary and secondary disability, functional limitations as a result of the listed disabilities, vocational goal, services requested, and clinical reports enclosed (please see Appendix A). This form is necessary for the Easter Seals Massachusetts Clinical Supervisor to screen and assigned the client to an Assistive Technology Specialist. The Assistive Technology Specialist reviews the form and contacts the client to initiate the evaluation procedures. No modifications are needed on this form.

Once the assignment is made, key client information such as name, location, and date of referral are logged into a Microsoft Excel spreadsheet and Microsoft Access database by the Easter Seals Massachusetts Clinical Supervisor. The Microsoft Excel spreadsheet is utilized by the department director and administrative staff for tracking referrals. The Microsoft Access database is necessary for keeping track of clinician caseloads and assignment progression. See Appendix D for a visual representation of referral and intervention procedures.

Although key dates are logged and multiple staff are involved in the referral procedures, few safeguards are present to ensure that procedural benchmark expectations are met. It is ultimately the responsibility of the Assistive Technology Specialist to keep track of their caseload and to alert the referral source and organization leadership of unforeseen deviations of protocol such as evaluation or report delay. The Assistive Technology Clinical Supervisor sends caseload lists electronically to Assistive Technology Specialists once per month, to ensure no referrals had been missed, and to prompt field staff for communicating to administrators about any deviations of protocol.

Even with the presence of the safeguard, it could be up to five weeks for a missed referral to be acknowledged.

Modifications will be made to the procedure to improve tracking compliance with contractually agreed-upon benchmarks from Figure 5. In addition to tracking date of assignment, the Microsoft Excel tracking spreadsheet will be enhanced to track additional data such as date of report completion by AT Specialist, date of report submission to MRC AT coordinator, and date of MRC AT coordinator approval. This data will be entered by the AT clinical supervisor and administrative assistant, and will be reviewed weekly by the AT clinical supervisor. Progress reports will be provided to the MRC AT Coordinator on a monthly basis.

Implement Changes to Evaluation Procedures

The assessment procedures will be revised to promote best practices. In considering the diversity of the intended program population, few options exists that will be able to be utilized for all clients. All program participants will have a chronic disability, but this disability may impact physical functioning, cognitive performance, psychosocial functioning or a combination of multiple domains. Potential clients may be receiving vocational rehabilitation services to assist in preparation for a career (educational goals), searching for a job, or to determine accommodations or tools to improve their ability to maintain employment.

The MPT Assessment is comprehensive and possesses the versatility to meet the diverse needs of the referred client population (Scherer, 2007). Three Assistive Technology Specialists with varying levels of clinical experience and different

professional backgrounds were selected to trial the use of the MPT in practice. When interviewed, these field staff presented a critical review of the MPT assessment. Two of the three clinicians found value in specific components, such as the Initial Worksheet and Survey of technology use. All three clinicians felt that administration of the complete battery was too time consuming. They felt it was difficult to keep the client engaged in the process, and the battery did not collect all the information that was requested and required from the referring agency and reviewer. The referral source and payor expects that the majority of evaluations are completed in a single visit, and administration of the MPT would make this impossible. Further, there is only minimal evidence to support the use of the MPT assessment in practice (Scherer, et al., 2005). The author indicates that the evaluation can be used as a complete battery, or specific components can be selected for more targeted assessments (Scherer, 2007). At this time, the MPT does not seem like an ideal fit for all evaluations performed by this program, though components of this assessment, such as the Survey of technology use and the Assistive Technology Predisposition Form can be useful resources if selected by the AT Specialist. Training in the use of these components will be scheduled for clinical field staff that performs evaluations.

No single measure is sufficient for gathering all of the information that is necessary to make informed choices about assistive technology, and to gather necessary information required to justify provision of assistive technology devices and consultation. The best option for the assessment is to develop a semi-structured interview protocol. An interview and assessment protocol will be developed by this author incorporating

relevant, age-appropriate, task-appropriate and context-appropriate topics and queries from existing assessments such as the MPT and FEAT (Scherer, 2007; Raskind & Bryant, 2002). Objectively measurable information may be gathered, including silent reading in words per minute, handwriting speed in words per minute, and typing speed with adjustments for misspellings in words per minute. Additional topics will be added based on feedback and the needs from key stakeholders such as vocational rehabilitation counselors from the referring agency, the AT Coordinator from the referring agency, current assistive technology specialist field staff, agency leadership, and former clients who are assistive technology users. The interview and assessment protocol will be field tested with experienced and entry level assistive technology specialists, and will be revised based on the results of a focus group and interviews with stakeholders.

Context specific and role specific assessments with training resources will be made available for field staff. For individuals being evaluated in schools, copies of the WATI Assessment and the SETT Framework will be made available (Gierach, 2009; Zabala, 1995). Staff development workshops for clinical field staff that performs evaluations in schools can be arranged, and field staff with expertise in using these assessments can facilitate the training. The Time Management Questionnaire may be utilized to assess for limitations in executive function and time management. Staff training in assessment protocol can be performed by this author (Britton and Tesser, 1991).

The FEAT will not be utilized. Although the FEAT looks at the use of assistive technology in learning and educational contexts, the specific technology

recommendations incorporated throughout its scoring and worksheets are outdated and no longer relevant for current assistive technology practice (Raskind & Bryant, 2002).

Incorporate Regular Use of Outcome Measures

Regular use of valid and reliable outcome measures will be incorporated into the program, and will be discussed in detail in Chapter 4. This will include the adoption of a valid and reliable procedure for determining intervention objectives, and progress toward objectives. Methods for measuring other outcomes such as client satisfaction and quality of life will be discussed.

Promote Intervention Strategies Grounded in Theory and Evidence

Once the evaluation is performed, recommendations are made, equipment is purchased, and installation is completed, the AT specialist will engage the client in several sessions of training to learn skills for utilizing the assistive technology to meet their personal, educational, and vocational goals. The AT specialist will fulfill the role of educator, and will likely have to adapt their training to accommodate the specific needs of the client learner. While some of our AT specialist field staff have backgrounds in Special Education, Speech and Language Pathology, and Occupational Therapy, not all staff have had training or experience in being an educator.

We will develop an engaging staff training designed to highlight the specific needs of adult learners (Knowles et al., 1998). This workshop will provide AT specialist field staff with necessary tools to design effective client education programs to meet the needs of diverse learners. Staff will be encouraged to design training and education

interventions utilizing the five conclusions of adult learners by Eduard Lindeman in Figure 4 as a guide (Knowles, et al., 1998). To support motivation, clear connections will be drawn between the training objectives and the individual's vocational rehabilitation goals. To support life-centered orientation to learning, assistive technology training sessions will take place in the contexts and locations in which the individual will be utilizing the assistive technologies for their vocational and educational goals. To enhance relevance of services, assistive technology specialist will utilize the client's own course syllabi, course assignments, and job tasks, in the context of training sessions. To tap into prior skills, the individual's experiences and strengths will be integrated into the AT training process whenever possible. Assistive Technology Specialists will partner with clients as they engage in a process of mutual learning. To acknowledge and respect individual differences, assistive technology specialists will demonstrate flexibility when identifying the time, location, and training activities with adult learners (Knowles et al., 1998).

Knowledge about evidence will enhance the practice of AT Specialist field staff. We will create a journal club that will meet monthly to select, critically appraise, present, and discuss the peer-reviewed research article about an assistive technology intervention. To meet the needs of the itinerant AT Specialists, this journal club will utilize electronic tools for collaboration that may include a teleconference system that already exists within the organization, or a videoconferencing system that is free and commercially available such as Google hangouts. Articles will be available electronically for all participants to review prior to the meeting, and a single or pair of AT Specialist will critically appraise

and present the key procedures and findings of the research. Peer-led initiatives such as journal clubs and team evidence searches have been found to improve practitioner evidence based practice capacity in school settings (Cahill, Egan, Wallingford, Huber-Lee, & Dess-McGuire, 2015) and for interprofessional teams in multiple settings (Novak & McIntyre, 2010). Occupational Therapy and Speech and Language Pathology clinicians who have training and experience in evaluating evidence can serve as models and resources to AT specialists who have not received this training.

Community-based assistive technology assessment and training, as used in the existing assistive technology program at Easter Seals Massachusetts, is supported in the evidence-based literature (Sohlberg et al., 2005; Raghavendra, et al., 2013). We will continue to perform assessments and intervention in the clients' living environments such as home, school, workplace, and community. Client-centered practice that integrates the assistive technology user in the decision-making process has also been found to lead to positive outcomes (Lenker, & Paquet, 2004; Johnston, et al., 2014; Scherer, et al., 2005). A key value of Easter Seals Massachusetts is to provide client-centered services. We will continue to engage the client in the assessment and decision-making process by using collaborative assessment tools, outcome measurement processes, and training interventions.

There is support in the literature for the use of several assistive technologies. Evidence exists for utilizing cognitive aids to daily living for individuals with executive function impairments such as autism spectrum disorder (Gentry, et al., 2010; Gentry, et al., 2015), and individuals with cognitive impairment from progressive and chronic

neurological conditions (Gentry, 2008; LoPresti, et al., 2008; Lindqvist, et al., 2015). This review suggests that electronic aids to daily living, such as visual and auditory cueing and reminder systems in smart phones, tablets, and other mobile devices, are practice recommendation for individuals with autism and cognitive impairment from progressive neurological conditions. Electronic aids to daily living are a practice option for clients with similar needs, including those with learning disabilities or congenital cognitive impairment.

Some evidence exists that supports the use of synthesized text to speech assistive technologies by individuals with learning disabilities (Floyd and Judge, 2012) and adults with brain injury (Harvey, et al., 2013a; Harvey, et al., 2013b). This evidence supports that synthesized text-to-speech screen reading can improve reading rate (Floyd and Judge, 2012; Harvey, et al., 2013a; Harvey, et al., 2013b), though the studies were limited by small sample size and high variability among participants. Use of synthesized text-to-speech screen reading may be a practice recommendation for individuals who have a slow baseline reading rate and may be required to read a large volume of print materials to fulfill their employment or educational roles. Because the research literature has been inconclusive on synthesized text-to-speech screen reading software's impact on reading comprehension, use of this tool may be a practice option for individuals who have poor reading comprehension (Floyd and Judge, 2012; Harvey, et al., 2013a; Harvey, et al., 2013b).

Performing Program Evaluation

We anticipate that the changes to the current program will have several outcomes. By enhancing program monitoring, integrating techniques and strategies grounded in theory and evidence, and utilizing meaningful outcome measures, the assistive technology consultation program will be more effective in meeting its objectives.

By improving monitoring of program procedures, our organization will know if it is meeting benchmarks set by the referring agency. Data on whether clients are seen and reports are written within the expected timeframe can help in managing caseloads, determining staffing needs, and identifying areas where additional training is necessary. By developing a protocol in which these outcomes are monitored on a routine basis, organizational leadership will be aware of potential issues in meeting benchmark expectations before it becomes an issue with the referring agency. This data will be shared with organizational leadership, and can be shared with field staff, the referring agency, and potential donors.

By improving consistency with assessment procedures, the quality of client evaluations will be improved. By educating field staff in skills for objectively measuring client capacities and methodically collecting essential information, client needs will be better understood and justification for assistive technology equipment and consultation will be clearer to the reviewers.

By establishing a culture that values evidence-based practice and a process for evaluating emerging evidence, the field staff will be more likely to consider available evidence when making recommendations. Knowledge about existing and emerging

evidence will ensure that field staff is using the most appropriate interventions and assistive technology equipment recommendations for the clients served.

Finally, the use of valid and reliable outcome measures will help determine if the program and interventions provided are effective. Analysis of data from these outcome measures can help determine the effectiveness of intervention for all clients as a whole, groups of clients with similar characteristics, and individual clients. Establishing a method to consistently collect client satisfaction data will help identify areas in the service delivery process that need enhancement and improvement. Data from outcome and satisfaction measures will be utilized by organizational leadership and can be shared with field staff, referral sources, potential grant providers, and potential donors.

Barriers for Proposed Program

As discussed in the introduction, the assistive technology peer reviewed literature has identified that there is a dearth of quality evidence related to best practices for assessment, intervention and outcomes measurement in community settings (Smith, 1996; Lenker & Paquet, 2004; Martin, et al., 2008; Anttila, et al., 2012; Thomas, et al., 2015).

Rapid technology advances, changing perceptions on technology and changing lifestyles within populations makes it difficult to study and report on specific assistive technologies (Andrich, et al., 2013). A study that utilized PalmPilots as cognitive aids to daily living was not published until 2008, when these personal digital assistants (PDA) were an outdated discontinued class of technology that had been replaced by the growing smartphone market (Gentry, 2008). The literature emphasizes that the client centered

nature of assistive technology assessment and intervention makes it difficult to standardize a specific training protocol (Andrich, et al., 2013; Stumbo, Martin, & Hedrick, 2009). This results in fewer high quality random controlled trials (Anttila, et al., 2012).

Finally, we anticipate that organizational change will be a challenge. Although there are some recent hires, the majority of the staff at the assistive technology department have extensive experience in the field and at the agency. Assistive technology clinical staff have worked an average of 8.75 years for Easter Seals Massachusetts, and have an average of 11 years of clinical assistive technology experience. Staff that has been accustomed to performing job tasks in a particular way for a long period of time may find it difficult to change their work practice. Further, salary costs and the itinerant nature of the field staff may make it difficult to provide staff education, mentoring, and supervision. While electronic and telephone communication can be frequent, face-to-face interaction may only occur on a monthly or quarterly basis.

The program, as designed, has taken these barriers and challenges into account. It is anticipated that features of the program will be able to compensate for many of these barriers. The available evidence is essential to inform the establishment of the program, but effective program evaluation will help leadership understand if the program is effective in meeting its objectives.

CHAPTER 4: EVALUATION PLAN

Identifying the Need for an Evaluation Plan

Program analysis and a review of the evidence-based literature has led this author to conclude that an enhancement of program outcomes collection and analysis is necessary for the assistive technology consulting program. Several steps will be taken to improve outcomes measurement on the individual client level and on an aggregate program level. Currently, a number of outcomes are monitored by the department director, including the number of evaluations performed and the number of consultation hours. These outcomes are utilized to determine staffing needs and to inform decisions about adjusting rates and fees for services. This analysis is insufficient to ensure that quality services are provided.

Evaluating Outcomes on the Individual Level

A thorough search for outcome measures was conducted and several were critically considered. Taking into account the diversity of the intended program population, it was difficult to find a single assessment that would be able to be utilized for all. Program participants are adults who have a chronic disability that may impact physical, cognitive, or psychosocial functioning. These individuals may be receiving vocational rehabilitation services to assist in preparation for a career, searching for a job or to succeed in keeping a job.

Two assessments may hold potential for the program. They are the Canadian Occupational Performance Measure (COPM) and the Goal Attainment Scale (GAS). Both assessments have the versatility to address the needs of each of these subgroups

(Law, et al., 2004; Kiresuk, & Sherman, 1968). Scoring and interpretation for each measure is relatively simple, and intervention effectiveness can be determined on a case-by-case basis without extensive analysis.

A critical analysis of the COPM revealed that this measure had many strengths that complemented the current program. The COPM is client centered, relatively low-cost, does not require special certification or competency to administer, is widely used and familiar to many practicing occupational therapists, can be completed in 10 to 20 minutes, and collects a wealth of client-centered information from a diverse population (Law, et al., 2004). Unfortunately, the diversity of practitioners in the current program may be too great a barrier for utilizing the COPM as a measure. The COPM authors emphasize that trained occupational therapists are the best practitioners for understanding and determining occupational performance limitations. The authors warn that interdisciplinary use of the COPM may extend the measure outside of the occupational performance domain, and the measure may no longer have the validity and reliability qualities as the intended COPM (Law et al. 2015). For non-OT assistive technology specialists, extensive training and mock-assessments will be required, and may not lead to acceptable consistency and reliability in assessment performance. Having the assistive technology specialists who are OTs administer the initial and follow up administrations of the COPM was considered, but it would be a logistical challenge. Two OT assistive technology specialists were recently promoted to leadership roles, reducing the amount of clinical availability of occupational therapist assistive technology specialists in the field. A higher concentration of staff OT assistive technology specialists live in the eastern part

of Massachusetts, and it would be difficult for covering assessments that occur in the western part of the state. Additionally, this would stress the OT resources at the organization, and potentially leave the other skilled professionals underutilized.

The GAS is a versatile outcome measure that may meet the diverse objectives and characteristics of the clients served by the program (Hurn, et al., 2006). This assessment can be initiated during the evaluation process, achievement of goals can be reassessed monthly while participating in training, and final assessment can be determined at discharge. The GAS can be incorporated into monthly documentation as a reliable and valid replacement for the adapted 0–7 functional outcome scale that is currently being used (see Appendix C). Training of staff will be required to teach the necessary skills to ensure uniformity in administering the GAS. A new monthly progress note template incorporating the GAS will be created and distributed to staff. Meetings will be arranged with key stakeholders, such as referring vocational rehabilitation counselors and program administrators, to provide education on the GAS and its use for monitoring client outcomes. Please see Appendix E for a draft of the revised monthly progress note. This draft contains content controls to promote uniformity in completion. The scores of the GAS are described so that reviewers that are unfamiliar with the GAS will understand if a goal has been attained. Please see Appendix F for a completed sample of the monthly progress note.

The GAS will be administered to all clients, and GAS scores will be compiled for each service delivery session. These electronic data collection forms will be stored on the organization's password protected and encrypted server. Because the client

population is so diverse, a summary and analysis for all clients may not yield meaningful results. Periodically, groups of clients will be selected for analyses. Groups may be selected based on the client's age, nature of the vocational goal, geographic region of services provided, referring case manager, medical diagnosis, or by which specialist had provided services.

Perceived quality of services and client satisfaction are important outcomes that can impact the success of a program. If program participants do not feel that they received quality service in a timely manner with courteous and respectful staff and providers, they would terminate participation in services and report the negative experience to the referral source. Through a post-discharge feedback form, we can determine if the vocational rehabilitation client had a positive impression about the services that they received, if the clients felt that their AT specialist was available and sensitive to their needs, and if the clients felt they learned skills that will be helpful to achieving their vocational goal. Some of these outcomes are currently measured via a feedback survey in a different program within the assistive technology department, though data collection is a passive process and the response rate is poor. For cost-effectiveness, a survey can be developed utilizing the free online Qualtrics, Survey Monkey or GoogleForms systems, and responses can be anonymous. A telephone-based interview can be performed as an accommodation for individuals who do not have access to the Internet or unable to participate in the Internet-based survey due to functional limitations of their disability.

The burden of administering a survey to all program participants with appropriate efforts to maximize survey participation is not practical with our current level of staffing and funding. We will consider a random representative sampling of participants. By using a smaller sample, we can utilize strategies to improve response rate such as alerting selected individuals in advance that they will be receiving a survey, delivering the survey in a timely fashion, then following up to ensure completion of the survey (Adams, 2010).

The proposed survey will include questions such as "did the assistive technology specialist listen to your needs and concerns," "was the assistive technology specialist knowledgeable," and "would you recommend Easter Seals assistive technology services to a friend or colleague." The proposed survey will contain items that will collect quantitative data using a Likert scale, as well as qualitative data using open-ended questions. The quantitative data will allow for simple analysis and presentation of compiled information for stakeholders and interested parties. The qualitative information received from the surveys can be useful in developing client stories about the personal impact of services, and can further supplement program briefs, annual reports, and promotional/fundraising materials. Reminders can be sent to improve response rate, which will improve the validity of the results (Adams, 2010). Please see Figure 7 for questions that may be included in this feedback survey.

Figure 7: Sample questions for feedback questionnaire

1. The assistive technology specialist was kind and treated me with respect.	*Strongly agree 5*	*Agree 4*	*Neutral 3*	*Disagree 2*	*Strongly disagree 1*
2. The assistive technology specialist listened to my concerns and personal goals.	*Strongly agree 5*	*Agree 4*	*Neutral 3*	*Disagree 2*	*Strongly disagree 1*
3. The assistive technology specialist was on time and easy to contact.	*Strongly agree 5*	*Agree 4*	*Neutral 3*	*Disagree 2*	*Strongly disagree 1*
4. I learned skills and strategies that will help me achieve my vocational goal.	*Strongly agree 5*	*Agree 4*	*Neutral 3*	*Disagree 2*	*Strongly disagree 1*
5. What is something that you have learned from your participation in the assistive technology evaluation and training process?	_____ _____ _____				
6. I would recommend Easter Seals Assistive Technology Services to a friend or family member.	*Strongly agree 5*	*Agree 4*	*Neutral 3*	*Disagree 2*	*Strongly disagree 1*
7. Why would you choose or not choose to recommend Easter Seals Assistive Technology Services?	_____ _____ _____				

Perceived quality of service data will be collected from a random sample of discharged clients on a monthly basis. Analysis will be performed on a quarterly basis, and will include descriptive statistics. Perceived quality of service outcomes collected will be reviewed by organization leadership to determine effectiveness of programs and to understand patterns of service delivery. Perceived quality of service outcomes will be shared with staff on a quarterly basis, and may be shared with stakeholders such as referral sources, funding agencies, legislators, advocacy groups and potential donors.

Evaluating Outcomes and Quality at the Program Operation Level

When leading a large group of practitioners with diverse backgrounds and levels of experience, it is important to understand if all field staff are providing services at an acceptable level of quality and consistency. Maintenance of quality standards will be determined through ongoing monitoring, quarterly documentation and process audits, a peer-reviewed documentation review program, and a peer-reviewed session observation program.

It will be essential to understand if the services provided are meeting benchmark guidelines of quality set forth by the referring and funding agencies. Figure 5 outlines benchmark expectations set forth by MRC vocational rehabilitation services. The average assistive technology specialist caseload is around 50 clients. Secondary to the approval and procurement process, approximately half of these clients are in an inactive status pending recommendation approval, equipment purchase or equipment delivery. The clinical supervisor maintains a Microsoft Access database to keep track of each assigned client, their location, and activity status. A caseload update is sent to each assistive technology specialist every two months to ensure continuity of care and to make sure that client assignments were not missed. It is the responsibility of the assistive technology specialist to meet benchmark expectation dates, and to communicate with the referring agency for deviations. As a result of this inquiry, it is determined that every two months is an insufficient amount of time for these caseload updates to occur. The clinical supervisor will send caseload updates to the assistive technology specialists on a monthly basis. Clients that are nearing benchmark expectations will be highlighted to alert the

assistive technology specialist that action is necessary.

The clinical supervisor and administrative staff currently maintain an Excel spreadsheet that compiles referral information for quick reference. This Excel spreadsheet will be enhanced to compile and track whether key benchmarks have been met. Maintenance and monitoring of this spreadsheet will be shared between the administrative staff, the clinical supervisor, and the department director. This centrally located resource will allow multiple parties to reference whether an evaluation has been completed and documented, whether it has been reviewed or approved by the referral source, and whether the referring source has confirmed that the client is eligible for services. Regular review of this spreadsheet can trigger action when necessary to ensure that services are being delivered in a timely fashion.

Compliance with procedures and quality standards will be determined at the client level through a documentation peer review program. Although no data exists regarding peer review programs for assistive technology specialists, a study that examined a peer review program for pharmacists found that it was a positive experience (Haines, et al., 2010). This concluded that peer review of documentation improves self-reported quality of practice and awareness of best practices (Haines, et al., 2010).

It is anticipated that anonymous peer review of documentation can allow a critical assessment of the documentation being produced, as well as enhance the documentation quality of the reviewer. To provide structure for the review, a peer review feedback form has been developed and can be seen in Appendix G. An evaluation report or monthly progress report will be selected at random, and identifying client and clinician

information will be removed by the clinical supervisor. A report number will be assigned for tracking, and logged in a database that is password-protected and accessible only to the clinical supervisor and department director. The reviewer will be asked to critically assess the documentation on whether it achieved benchmark expectations for completion, whether it sufficiently addresses all content areas, and if it is of high structural quality for grammar and spelling. The identity of the reviewer will be removed prior to sharing the documentation with this author. In the study of pharmacists, it was reported that clinicians were more likely to provide honest and constructive feedback when anonymity was maintained (Haines, et al., 2010). Each assistive technology specialist will have one documentation reviewed by a peer each quarter, and will be expected to review one documentation for a peer each quarter.

Clinical observation can provide the field staff with specific feedback to enhance quality of services provided (Dattner & Lopreiato, 2010). Assistive technology specialists perform services within their own region throughout the state of Massachusetts. Manager observation for all staff will be a logistical challenge, as some staff live over 100 miles away from the clinical supervisor. A peer observation and feedback review program will be trialed, as field staff can be observed and evaluated by peers who live and work within closer proximity to them. A study of pediatric residents in a university hospital reported that peer observation and structured clinical observations helped to enhance development of clinical skills and the quality of service (Dattner & Lopreiato, 2010). A clinical observation feedback tool will be developed for structuring observation and enhancing the quality of feedback provided. This process will be

initially trialed with two dyads and a focus group will be held to assess the effectiveness of the program and data collection instrument. Results of the trial can be shared with organization leadership for approval to move forward with department-wide launch.

Outcomes at the program level can be utilized by organization leadership to identify areas for program operations improvement, and key areas for staff development. These outcomes may also inform supervisors of staff performance, and feedback can be shared with field staff during supervision meetings and annual review. Program monitoring data can be shared with referral source as requested, and can strengthen the relationship between the organization and its funding sources.

Integration of the Logic Model

A logic model, represented in Appendix H, integrates existing features of the assistive technology consultation program, and program enhancements proposed by this analysis. The existing features are listed in standard font, and the proposed enhancements are presented in italic font. This logic model displays the relationships between program inputs and resources, the theoretical frameworks and perspectives to inform the program, the program outputs, program outcomes and the influence of external and environmental factors.

Program inputs include the referred clients that are being served, and organizational resources such as staff, funding and equipment. The nature of the problem is defined and the theoretical perspectives are listed. The existing interventions and activities are presented, and include AT assessment and documentation, seeking of funding for AT devices and services, and provision of AT training and follow up.

Additional activities and outputs that are recommended by this report include monthly quality assurance data collection and analysis, launch of a peer review documentation program, and trial of a structured clinical observations program by peers. The existing outputs include a tally of the number of evaluations performed, the number of recommendation reports approved, and the number of consultation hours performed. The new recommended processes will yield collection of several new outputs, including client outcomes as measured by the Goal Attainment Scale, generation of biannual reports to share with key stakeholders, and client feedback.

As a result of these new program outputs, several new, short-term outcomes are anticipated, including clear data on whether the client has learned new skills, clear data on whether the client is using new skills to improve performance, and whether the program is operating to quality standards. The intermediate and long-term outcomes include whether the client consistently and successfully utilizes the tools to enhance function outside of the assistive technology training. Because the services are provided in a consultative model, and our organization does not interact with the client following the completion of AT training, no mechanism is realistic to assess for client-oriented intermediate and long-term outcomes.

An essential program-level long-term outcome that will be apparent is whether the referring and funding sources are satisfied with outcomes and outputs. If satisfied, the funding sources may continue to prioritizing funding for AT consultative services, and continue to contract with the organization to provide these services. Organization leadership communicates regularly with referral and funding sources. It will be a priority

to share program outcomes, and to respond to referral and funding source requests.

Overall, a methodical approach to outcomes collection and analysis may lead to a higher quality of service, and may optimize client satisfaction, referral source satisfaction, and outcomes achievement.

CHAPTER 5: FUNDING PLAN

Introduction

Outcomes of assistive technology services in a community based organization aims to review and enhance an existing assistive technology consulting program at a community-based nonprofit organization. The existing program is funded in whole by competitive contracts and consulting fees. This funding plan will be estimating the costs of the program enhancements recommended by this report, and will determine potential funding sources to cover these costs. Routine operating expenses for the existing program, which include salaries and benefits for existing staff, equipment and supply expenses, local travel reimbursement, and office space rental, have already been determined and accounted for by the department director and vice president of service. This funding analysis will not consider these existing operating costs because they are already funded.

Anticipated Costs of Program

Several initiatives recommended by this report will require support above the current operation costs. These costs include staff salaries to cover training in the use of the Goal Attainment Scale (GAS), administrative assistant salary costs associated with an enhanced outcome tracking method, and clinical field staff salaries to support participation in a monthly journal club, quarterly peer documentation review, and trial of peer structured clinical observation. Cost will also be considered for dissemination activities.

It is anticipated that the proposed program will be launched in three phases. Phase

I, the implementation phase will involve implementation of new processes such as staff training in the use of the Goal Attainment Scale, and the launch of quality assurance protocols. Phase II, the operations phase will involve completion of the implementation process and operation of the enhanced program with collection and monitoring of outcomes. Phase III, the dissemination phase will involve continued operation of the program and collection of outcomes, analysis of outcomes, and pursuance of dissemination activities.

Phase I: Implementation

It is estimated that Phase I will be 8–12 weeks in length. The primary objectives of Phase I will be to partner with key stakeholders, launch new processes, and to educate staff. New evaluation report and monthly progress note templates will be created and presented to key stakeholders. Staff will require training in selecting and performing appropriate assessment measures for client evaluations. These measures include the Matching Person and Technology (MPT) Scale (Scherer, 2007), the Time Management Questionnaire (Britton and Tesser, 1991), the WATI Assessment (Gierach, 2009), and the Student Environment Task Tools (SETT) Framework (Zabala, 1995). Workshops will also be held to educate clinicians on the best practice for training adult learners with diverse abilities and needs, with consideration of adult learning theory (Knowles et al., 1998). Clinical staff will require training in administering and tracking outcomes using the Goal Attainment Scale (GAS) (Hurn, et al., 2006). It is anticipated that staff will require 10 hours of training to address the learning objectives of Phase I. Anticipated costs of training are summarized by Figure 8. The average estimated salary for Assistive

Technology (AT) Specialists is $31 per hour, and a 3.5% rate increase is factored in between Phases I and III. The organization's main office is centrally located and has sufficient free space for performing the training, so no additional expense will be incurred for renting training space. The staff prefers review and use of digital documents, so it is anticipated that training materials and printing expense will be relatively low at $100 for Phase I and $50 for Phase II. These trainings will be facilitated by the clinical supervisor, and preparation and execution of training is accounted for in Figure 9, ongoing expenses. Training expenses are anticipated to be $6,200 for Phase I.

Figure 8: Staff Training and Meeting Expenses

	Phase I	Phase II	Phase III
Number of Clinical Staff	20	20	20
Est. Average Hourly Salary	$31.00	$31.50	$32.00
Number of Training Hours	10	8	6
Space rental	$0	$0	$0
Training materials/printing	$100.00	$50.00	$50.00
Total	$6,200.00	$5,040.00	$3,840.00

During Phase I, new processes for monitoring program benchmarks will be launched. Spreadsheets tracking referral and report dates will be created by the clinical supervisor and administrative staff will be trained in procedures to update and maintain the forms. Templates for peer review of documentation and clinical observations will be drafted, and will be reviewed by department director and the vice president of services. A schedule for tracking benchmark and quality assurance analysis will be created in preparation for performance in phase II.

Figure 9: Administrator Expenses

	Phase I	Phase II	Phase III
Number of weeks	12	40	52
Clinical supervisor hours/week	10	5	10
Clinical supervisor rate	$38.00	$38.00	$39.30
Admin assistant hours/week	5	5	7
Admin assistant rate	$20.00	$20.00	$21.00
total	$5,760.00	$11,600.00	$28,080.00

Figure 9 summarizes the expected administrator expenses for the project launch. Project implementation will be spearheaded by the clinical supervisor, and will require 10 hours of effort and time each week in Phase I for development of staff trainings, creation of tracking spreadsheets, development of peer review forms, development of client feedback forms, and to create new templates for evaluation reports and monthly client training notes. Phase I will also require five hours per week of support from the administrative assistant to learn procedures for tracking benchmarks, to facilitate communication with clinical field staff, and to begin entering data into client tracking spreadsheet.

Phase II: Operations

It is estimated that Phase II will be 36 to 38 weeks in length. In this phase, clinical staff will integrate new processes into daily practice. It is anticipated that fine tuning will be required to meet program expectations. Program monitoring will continue and new initiatives such as the documentation peer review, structured peer clinical observation, and journal club will be launched. As the majority of staff education will

have taken place and new processes will have been launched, it is anticipated that clinical supervisor weekly time commitment will be reduced to five hours per week during Phase II. Data will be entered weekly by the administrative assistant into the tracking sheets, and analysis of data will begin.

Phase III: Operations and Dissemination

It is estimated that Phase III will be approximately 52 weeks in length. Beginning one year after the initial launch, Phase III will allow completion of initial analyses and consider opportunities for dissemination. It is estimated that the clinical supervisor time commitment will increase to allow for analysis and reporting of program outcomes. Additional details regarding dissemination activities are available in Chapter 6.

Figure 10: Expense Estimate Over 2 Years

	Year 1 (Phases I & II)	Year II (Phase III)
Clinical Staff partial salary support for training	$11,320.00	$3,960.00
Printing cost for training	$200.00	$100.00
Encrypted laptop computer	Existing program expense	Existing program expense
Secured wireless network	Existing program expense	Existing program expense
Locked file cabinet	Existing program expense	Existing program expense
Clinical supervisor partial salary support	$12,160.00	$20,436.00
Administrative Assistant partial salary support	$5,200.00	$7,644.00
Dissemination expenses (meetings, travel, conference fees, printing)	$250.00	$2,925.00
total	$29,130.00	$35,065.00

Funding Summary

Figure 10 represents a summary of expenses for the first two years of the project. Several resources have been accounted for in the existing program budget, including provision of an encrypted notebook computer with Easter Seals Massachusetts Information Technology department support, a secured wireless network for staff communication and storage of electronic files, and a locked file cabinet for securing confidential paper records. Several program features will demand staff time beyond what had been budgeted and accounted for in the existing program. It is estimated that each clinical staff member will require 18 hours of training and support in year one, and six hours of training in year two. It is estimated that an administrative assistant will have to dedicate five hours per week for implementation and maintenance of program tasks. The clinical supervisor will likely apply five to ten hours of effort each week in year one, and ten hours of effort each week in year two of the project. During the dissemination phase, it is estimated that $250 will be required in year one for printing costs and expenses for meeting with key stakeholders, and $2,925.00 for travel, registration and printing costs for attending one local conference and one national conference. In total, it is estimated that Outcomes of assistive technology services in a community based organization will require $29,130 of funding for its first year of operation and $35,065 of funding for its second year of operation. This is a two-year operations cost of $64,195.

Anticipated Funding Sources

Potential funding sources have been considered for Outcomes of assistive technology services in a community based organization. Easter Seals Massachusetts

receives funding from private individual donors, private organization donors, fundraising events such as local community walks and an annual gala, fees for services rendered, and state grants. It is likely that the expenses anticipated from implementation of the proposed program will receive funding from a variety of sources. These sources may include funding through consulting fees and the existing operating budget, funding from public grants, and funding from private individual and organization donors.

Funding Through Consulting Fees and Existing Budget

The Assistive Technology program at Easter Seals Massachusetts is a fee-for-service program, and referring agencies pay consulting fees for all direct client services, e.g., evaluation, installation, training, and technical support. Many contracts also fund indirect tasks such as travel, report writing, communicating with referral sources, and administrative expenses. The Easter Seals Massachusetts assistive technology department currently has active contracts with numerous state and local government agencies including the Massachusetts state vocational rehabilitation program, the state vocational rehabilitation program of Connecticut, MassMATCH (Massachusetts Maximize Assistive Technology in Consumer's Hands), several local school districts, the Massachusetts Executive Office of Health And Human Services, the Massachusetts Department of Developmental Services, and a state Medicaid program for at risk individuals with multiple medical conditions. The expenses anticipated from implementation of Outcomes of assistive technology services in a community based organization can be discussed with the department director and the vice president of services for consideration of inclusion in departmental annual budget. The clinical

supervisor position already exists at the organization, and job duties may be shifted to permit participation in some or all of the tasks recommended by this project.

Public Funding Opportunities

Several public and private organizations offer grants to support capacity building, especially when it involves services for individuals with disabilities or the collection of and analysis of outcomes. Easter Seals Massachusetts possesses the capacity to seek out funding for developing and supporting programs. The director of development and the director of business and strategic development are specifically tasked with combing through Federal Register announcements, reading public organization newsletters, and communicating with professional organizations related to assistive technology in search of grant and funding opportunities.

Private Funding Opportunities

The development department at Easter Seals Massachusetts routinely works with local organizations and donors to generate seed money for starting initiatives and supporting programs. A well-defined program with clear objectives such as Outcomes of assistive technology services in a community-based organization may be attractive for some donors who value outcomes measurement. Recent donors include a national telecommunications company, a Massachusetts based financial services firm, a Massachusetts based ice cream and restaurant chain, and a local manufacturer of plastics. By connecting with the VP of development, specific private and organization donors can be identified and proposals can be drafted.

Through collaboration and coalition building within the Easter Seals Massachusetts organization, it will be possible to secure funding for part or all of the programmatic changes proposed in Outcomes of assistive technology services in a community based organization. Once the funding is secured prior to and throughout Phase I, dissemination activities may be considered and acted upon during Phases II and III.

CHAPTER 6: DISSEMINATION PLAN

Dissemination Goals:

The overall goal for Outcomes of assistive technology services in a community-based organization is to develop a comprehensive service delivery and outcome measurement system that is grounded in theory and informed by the evidence. Dissemination in year one of the project will focus on sharing results of the current analysis to key stakeholders of assistive technology (AT) consulting program at Easter Seals Massachusetts. If outcome data and program analysis from year one of the project yield meaningful results, numerous opportunities for dissemination to secondary audiences may exist.

Long Term Dissemination Goals (2–5 years)

1. Key stakeholders, including organization leadership and practitioners, funding sources, referral sources, and clients, will understand if assistive technology consultation is effective for helping individuals meet their goals.
2. Organization leadership, practitioners, clients and legislators will understand which groups may benefit most from assistive technology consultation.
3. Organization leadership and practitioners will understand what theoretical perspectives, evidence and best practices contribute to an effective assistive technology consultation program.

Short Term Dissemination Goals: (6 months – 2 years)

1. Organization leadership and referral sources will understand if program staff is consistently meeting quality benchmarks and expectations set forth by referral sources.
2. Organization leadership, referral sources and potential donors will understand if service recipients believe they are receiving quality services.
3. Program staff will integrate best practices for assessment, intervention, measurement, and service into their clinical activities.

Target Audiences:

The primary dissemination audiences are the key stakeholders for the AT consultation program at Easter Seals Massachusetts. These stakeholders include: organization leadership, assistive technology professionals employed by the organization, program administrators of referring and funding agencies, organization donors, and service recipients.

If outcomes demonstrate a clear impact of assistive technology services, project results will be disseminated to a secondary audience. This will include groups that may impact the availability of assistive technology supports and services such as legislators, program administrators, and potential referral sources. Secondary audiences also include individuals who provide or refer for assistive technology services, such as occupational therapists, occupational therapy assistants, speech and language pathologists, speech and language pathology assistants, physical therapists, physical therapy assistants, special educators, mainstream educators, education administrators, rehabilitation counselors, and

rehabilitation engineers. Finally, secondary audiences will include those who may use assistive technologies, including individuals with disabilities and their family/caregiver supports. When preparing materials for secondary audiences, language and frames of references will be adapted to be consistent with the International Classification of Functioning, Disability and Health (ICF) (World Health Organization, 2013). This will optimize the ability for individuals from global cultures and backgrounds to identify, interpret and utilize useful outcomes (World Health Organization, 2013).

Key Messages, Messengers and Dissemination Activities:

Please refer to Figure 10 for details regarding key messages, chief messengers and dissemination activities for the primary audience. These messages are the result of the current analysis, and are summarized in this manuscript. Dissemination activities listed in Figure 11 may begin immediately.

Figure 11: Key messages, sources and messengers, and dissemination activities for primary audience in Phase I.

Primary Audience	*Key stakeholders*: organization leadership, AT professionals employed by the organization, program administrators of referring and funding agencies, organization donors, and service recipients
Key Messages	• Active engagement of clients in the AT evaluation process appears to lead to better outcomes (Lenker, & Paquet, 2004; Johnston, et al., 2014; Scherer, et al., 2005) • A natural context has advantages over a clinic or center when it comes to AT assessment and intervention (Burke, et al., 2013; Gentry, 2008; Gentry, et al., 2010; Gentry, et al., 2015; Harvey, et al., 2013a; Harvey, et al., 2013b; Raghavendra, et al., 2013; Sohlberg, et al., 2005) • Use of an electronic cognitive aid was found to be effective for recalling events and tasks for individuals with cognitive impairment (Gentry, 2008; LoPresti, et al., 2008; Lindqvist, et al., 2015; Gentry, et al., 2010, Gentry, et al., 2015) • Synthesized text-to-speech screen reading assistive technologies were found to improve reading rate for individuals with learning disabilities (Floyd and Judge, 2012) and for adults with brain injury (Harvey, et al., 2013a; Harvey, et al., 2013b) • AT and AT services are difficult to study because AT users and contexts vary greatly (Smith, 1996; Anttila, et al., 2012), and technology is constantly changing (Andrich, et al., 2013; Anttila, et al., 2012) • The Goal Attainment Scale (GAS) is a reliable, valid, and sensitive tool for assessing the achievement of goals (Hurn, et al., 2006)
Sources and Messengers	• This Author, Clinical Supervisor at Easter Seals Massachusetts • Kristi Peak-Oliveira, CCC/SLP, Clinical Supervisor for Augmentative and Alternative Communication Specialists at Easter Seals Massachusetts • Eric Oddleifson, MSOT, Director of Assistive Technology Department at Easter Seals Massachusetts • Ann Donah, Director of Development at Easter Seals Massachusetts
Dissemination Activities	Written information: • Distribution of this project's executive summary to key stakeholders • Making full text of doctoral project available to key stakeholders • Composing descriptions and articles for organization print newsletters and monthly updates sent to organization donors Electronic Media: • Staff conference and communication will be held by teleconference and web conference for AT professionals employed by the organization • Email newsletters and monthly updates sent to organization donors Person-to-Person: • Staff training and workshops will be held for AT professionals employed by the organization • Presentations for administrators and staff of referring and funding agencies • Poster presentation at local and/or national conference

Figure 12 has details regarding key messages, chief messengers and dissemination activities for the secondary audience. These messages may vary in nature as a result of analysis of GAS and client feedback data collected in Phases I and II. Dissemination activities listed in Figure 12 will likely take place at the end of Phase III of this project.

Figure 12: Key messages, sources and messengers, and dissemination activities for secondary audience during Phase III.

Primary Audience	*Groups that may impact availability of assistive technologies and services*: legislators, program administrators, and potential referral sources *Groups that may provide assistive technology services*: occupational therapists, occupational therapy assistants, speech and language pathologists, speech and language pathology assistants, physical therapists, physical therapy assistants, special educators, mainstream educators, education administrators, rehabilitation counselors, and rehabilitation engineers *Groups who may use assistive technologies*: individuals with disabilities and their family/caregiver supports
Key Messages	• Active engagement of clients in the AT evaluation process appears to lead to better outcomes (Lenker, & Paquet, 2004; Johnston, et al., 2014; Scherer, et al., 2005) • A natural context has advantages over a clinic or center when it comes to AT assessment and intervention (Burke, et al., 2013; Gentry, 2008; Gentry, et al., 2010; Gentry, et al., 2015; Harvey, et al., 2013a; Harvey, et al., 2013b; Raghavendra, et al., 2013; Sohlberg, et al., 2005) • A presentation of the outcomes from analysis of GAS and feedback data in Phase III (analysis anticipated in Phase III)
Sources and Messengers	• This Author, Clinical Supervisor at Easter Seals Massachusetts • Kristi Peak-Oliveira, CCC/SLP, Clinical Supervisor for Augmentative and Alternative Communication Specialists at Easter Seals Massachusetts • Eric Oddleifson, MSOT, Director of Assistive Technology Department at Easter Seals Massachusetts
Dissemination Activities	Written information: • Submission of manuscript to peer reviewed journal • Submission of manuscript to professional magazine or blog Electronic Media: • Submit webinar proposals to assistive technology organizations such as Assistive Technology Industry Association (ATIA) and Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) • Submit webinar proposals to occupational therapy continuing education providers such as American Occupational Therapy Association (AOTA) and OccupationalTherapy.com. • Submit article for publication in Easter Seals Massachusetts

	newsletter and blog sent to organization donors Person-to-Person: • Submit proposal for workshop presentations at local conferences such as Massachusetts Association for Occupational Therapy (MAOT) annual conference and TechAccess Rhode Island annual conference • Submit proposal for workshop presentations at national conferences such as AOTA, ATIA and RESNA • Submit proposal for poster presentations at above listed local and national conferences

Dissemination costs are summarized in chapter 5, with details available in Figure 13. It is anticipated that year two will have the greater dissemination expense to cover travel and registration fees at two local conferences, and travel, lodging and registration fees at one national conference.

Figure 13: Dissemination Budget

Dissemination task	Year 1 Phase I	Year 1 Phase II	Year 2 Phase III	Explanation
Local meeting expense	$50	$200	$200	Estimated cost includes printing handouts and reports for stakeholder meetings
Poster Printing	$0	$0	$75	Estimated cost if poster presentation proposal is accepted
Local conference travel and registration	$0	$0	$150	Estimated cost includes gas, tolls and discount or free registration for presenter at two local conferences.
National conference travel and registration	$0	$0	$2500	Estimate cost includes travel, lodging, and registration fees
total	$50	$200	$2925	

Evaluation of the Dissemination Plan

Overall success of dissemination to the primary audience of key program stakeholders will be evaluated by several factors:

- Approval by leadership at Easter Seals Massachusetts to proceed with aspects of the current proposal by 2017
- Approval by leadership at referring organizations to proceed with aspects of the current proposal by 2017
- Participation and engagement by assistive technology specialist field staff in adoption of best practices by 2017
- Successful funding for part or all of the expenses related to implementation, through public grants and contracts, or private donations by 2017

If data analysis leads to compelling findings, dissemination activities will continue for secondary audiences during Phase III of the proposed project. Overall success for dissemination activities to these audiences will be evaluated by several factors:

- Acceptance of presentation proposal for local conferences in 2018
    - Number of conference participants attending this presentation
    - Feedback survey results from this presentation
- Acceptance of presentation proposal for national conference in 2018
    - Number of conference participants attending this presentation
    - Feedback survey results from this presentation
- Acceptance of poster presentation at local or national conferences in 2018

    - Number of conference attendees inquiring about this poster
    - Number of follow up correspondences regarding this poster
- Acceptance of manuscript in peer reviewed journal by 2018
- Publication of manuscript in professional magazine or blog by 2018
- Number of inquiries and responses following distribution of organization fundraising newsletter featuring project results in 2018

It is anticipated that a deliberate and multifaceted dissemination plan will allow for project results to reach a variety of audiences, including key organization stakeholders, professionals in the field, legislators and administrators who control funding for assistive technology devices and services, and individuals with disabilities who may use assistive technology.

CHAPTER 7: CONCLUSION

For an individual with a disability, assistive technology (AT) has the potential to improve independence and success when performing tasks and fulfilling roles that are meaningful (American Occupational Therapy Association, 2014; Cook & Polgar, 2015). AT equipment and services can help an accountant return to work after experiencing paralysis from a progressive neuromuscular condition, help a college student with a learning disability efficiently read the assigned coursework, and cue an individual with Autism when it is time to leave the house for a medical appointment (Floyd and Judge, 2012; Gentry, et al., 2015).

The AT evidence-based literature has clearly identified that there is a lack of quality evidence related to best practices for assessment, intervention and outcomes measurement (Smith, 1996; Lenker & Paquet, 2004; Martin, et al., 2008; Anttila, et al., 2012; Thomas, Barker, et al., 2015). Several factors impact the availability of quality evidence regarding assistive technology intervention best practices. Primarily, meaningful outcomes of assistive technology intervention can vary greatly depending on the individual, the activity and the context in which they are using the technology (Smith, 1996; Anttila, et al., 2012). There is a high level of variability in client factors, roles, expectations, cultural factors and contexts for individuals who use assistive technologies. When variables are controlled for, it is difficult to generalize research results to diverse populations (Smith, 1996). Because of technology advances and changing societal roles and perceptions, outcomes for assistive technology can be considered “moving targets” that change frequently over time, making it difficult to standardize in studies (Andrich, et

al., 2013; Anttila, et al., 2012).

This doctoral project aimed to develop a model using the best available evidence by which Easter Seals Massachusetts and other similar community based organizations can structure their assistive technology assessment procedures, interventions, and outcomes measurement. It is anticipated that the information collected through this comprehensive program evaluation can be used by Easter Seals Massachusetts to improve monitoring of organizational performance, maintain appropriate staffing levels, provide insight into employee training priorities, and identify problems with current program procedures. By educating field staff in skills for objectively measuring client capacities and methodically collecting essential information, client needs will be better understood and justification for services will be clearer to the reviewers. This information may also highlight functional improvements of clients being served, identify outcomes for clients receiving services, and justify the monetary costs for services. By integrating best practices into training, the quality and effectiveness of services may be improved. Conclusions drawn from the current analysis will be useful for organization leadership, assistive technology practitioners, clients served, referring agencies, and potential organization donors.

If outcomes that are collected and analyzed are meaningful, a second phase of dissemination will occur for secondary audiences. There is a potential for global impact outside of Easter Seals Massachusetts as a result of this project. Outcomes inform administrators, legislators, practitioners and members of the public for making referral, program development, and funding decisions (Smith, 1996; Newcomer, et al., 2010;

Mendelsohn, et al., 2008). Through a comprehensive dissemination plan, this doctoral project has the potential to make immediate and lasting contributions to the field of Occupational Therapy and assistive technology. By establishing a reliable and valid client-centered method for assistive technology outcomes monitoring and measurement, outcomes may be collected and analyzed for individuals with diverse abilities in multiple contexts. This can enhance understanding of the impact of assistive technology devices and services for specific groups of individuals and those participating in specific roles and occupations. Outcomes of assistive technology services in a community based organization may be able to contribute to the body of knowledge informing assistive technology practitioners, funding sources and AT users.

APPENDIX A: Program Referral Form

MASSACHUSETTS REHABILITATION COMMISSION
REQUEST FOR ADAPTIVE ASSISTANCE SERVICES

Client Information: **Date of Referral:**

Last First M. I.	Month/ Date/ Year
Name:	**Date of Birth:**
Street Apt No. City State Zip Code	
Address:	
Home Work email:	**Contact Person:**
Phone:	**Phone:**

Eligibility:
☐ VR ☐ IL Service Programs ☐ BISSC ☐ Homecare ☐ Other :

VR ONLY	**Case Status:**	**MRCIS #**	**Vocational Goal:**

Referral Source:

Last First	
Name:	**Office Location:**
Phone: **FAX:** ***email*:**	

Select Adaptive Assistance Service Provider :
☐ MA Easter Seals ☐ UCP of Berkshire County, Inc.

Referral Information:

Primary Disability _____

Functional Limitations:

Secondary Disability _____	**Additional Comments:**
Functional Limitations:	

Services Requested: ☐ Alternative Computer Access ☐ AAC

☐ Ergonomics ☐ Environmental Controls ☐ Other _____

Clinical/Therapy Reports Enclosed if any:

☐ **Physician**	☐ **Physical Therapy**	☐ **Occupational Therapy**
☐ **Speech Therapy**	☐ **Vocational Evaluation**	☐ **Eye Exam**
☐ **Neuropsychology**	☐ **Audiology Exam**	☐ **Other:**

Referral Staff Signature: _____ Date: _____

Rehabilitation Technology Program Only:

Date Received:	**Comments:**

Please send requests to AT Program Coordinator, Assistive Technology Department
MRC, 600 Washington Street, Boston MA, 02111, Tel. 617-204-3752, Fax: 617-204-3877

APPENDIX B: Evaluation Report Template

Opportunities to live, learn, work and play

Easter Seals Massachusetts

www.eastersealsma.org 800-244-2756

Massachusetts Rehabilitation Commission Vocational Rehabilitation Assistive Technology Evaluation

Client Name:

MRCIS#:

Vocational Rehab Counselor:

Date of Evaluation: List date(s) of in-person and phone-based consultations

Date of Report: Click here to enter a date.

Background/history:

Describe the client, vocational goal, and limitations we are attempting to address with AT. If eval or report is delayed, please explain reasons (i.e. waiting for info from client, delay in response for scheduling).

Functional Capacities:

Discuss the client's current performance in caring for themselves, managing appointments, negotiating environments, performing physical tasks. Describe any cognitive or perceptual impairments, speech limitations, and psychosocial issues.

Describe client's ability to engage in tasks they are expected to perform for their vocational goal (i.e. learning, typing, keeping track of appointments, keeping track of tasks, comprehend printed material, etc.).

Functional Limitations and Potential Assistive/Rehabilitation Technology Solutions:

List current equip (computer, tablet, smartphone, other device) with condition and specs (OS, RAM, CPU). Describe AT and tech/device use history and experience.
Identify AT solutions, and compare to AT and mainstream tech alternatives. All equipment must relate to vocational/educational goal. Describe how AT will "affect the capacity of the client to perform successfully in competitive employment."

Describe recommended modifications to the environment that will promote success in meeting vocational/educational goal.

Recommendation/Summary:

Brief summary of recommendations, ONLY (2–3 sentences). Provide the itemized listing of the recommended equipment on the LAST PAGE in the grid.

Thank you for this referral. We recommend hours of training in the use of this equipment. If you have any questions, please contact me at please enter ATS phone or email.

AT Specialist Name
Assistive Technology Specialist, Easter Seals Massachusetts
ATSpecialist_email@eastersealsma.org | AT Specialist ESMA Phone Number

Recommended Equipment List for Client's Name

Equipment	**Specific Link (if necessary)**
Choose an item.	
Choose an item.	
Choose an item.	
Choose an item.	
Choose an item.	
Choose an item.	
Click here to enter text.	
Click here to enter text.	
Click here to enter text.	
Click here to enter text.	
Click here to enter text.	

APPENDIX C: Existing Monthly Progress Note

Client Case Note
Easter Seals Massachusetts

Client Name: **John Smith**
VRC: **Jane Jones**
MRCIS#: **8675309**
Date of Note: **07/08/2015**
Training Dates this Month: 6/6/2015(client not home for scheduled appointment), 6/11/15, 6/18/15
Total Setup / Training Hours this Month: 5
Type of Note: Training Update

Update
Reader: Please refer to evaluation for background history

Client accepted delivery of equipment on: **1/11/2015**

1.) Device / software: **Laptop**
1st visit this month- Level of proficiency: *** Did not work on this equipment this visit.**
2nd visit this month- Level of proficiency: **0-Equipment set up only**
3rd visit this month- Level of proficiency: **2-Some ability to use. Max cues.**
4th visit this month- Level of proficiency: **Choose an item.**
Comments / Update on Vocational Goals: Client was not home for scheduled appointment on 1/06/2016. Rescheduled and met with client on 1/11/2016 to deliver and complete setup/installation of equipment.

2.) Device / software: **Dragon Naturally Speaking**
1st visit this month- Level of proficiency: *** Did not work on this equipment this visit.**
2nd visit this month- Level of proficiency: **0-Equipment set up only**
3rd visit this month- Level of proficiency: **2-Some ability to use. Max cues.**
4th visit this month- Level of proficiency: **Choose an item.**
Comments / Update on Vocational Goals: AT training during 1/18 visit had emphasis on speech recognition.

3.) Device / software: **Smartphone**
1st visit this month- Level of proficiency: *** Did not work on this equipment this visit.**
2nd visit this month- Level of proficiency: **2-Some ability to use. Max cues.**
3rd visit this month- Level of proficiency: **3-Moderately dependent. Moderate cues.**
4th visit this month- Level of proficiency: **Choose an item.**

Comments / Update on Vocational Goals: Configured smartphone with online backup of calendar.

A.) Recommend additional training, plan for continued training: The client has **7** hours of training remaining. Client limited by environmental distractions and decreased attention to task, but demonstrated understanding of skills during training session.

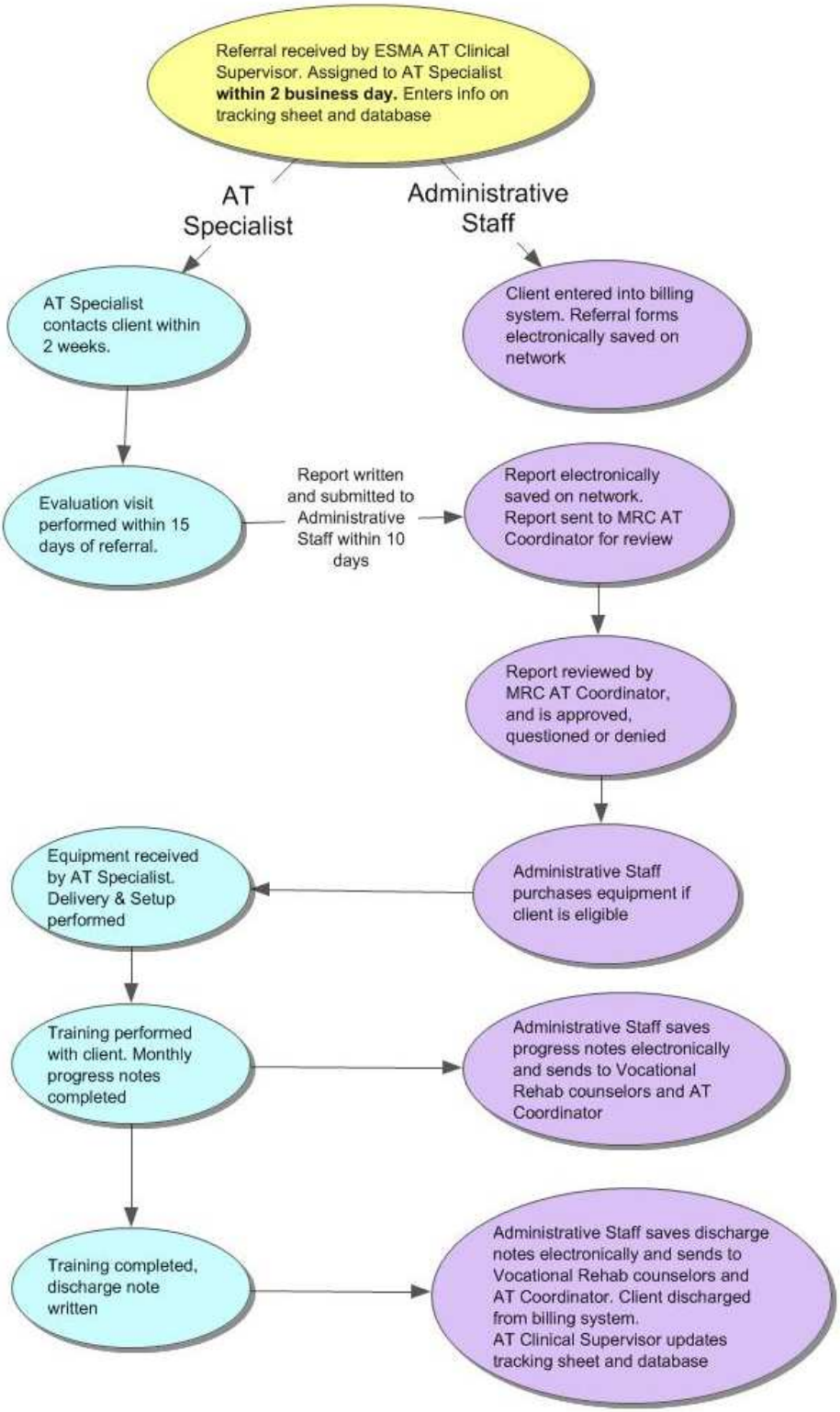
B.) Recommend additional equipment, justification for this equipment: **Click here to enter text.**

C.) Recommend discharge for meeting goals, client's progress towards vocational goals during training: **Click here to enter text.**

D.) Recommend discharge for other reason, client has not met their training goals: **Click here to enter text.**

Specialist: **Terry Therapist**

APPENDIX D: Referral and Intervention Procedures



APPENDIX E: Revised Monthly Progress Note

Assistive Technology Consultation Monthly Progress Note
Easter Seals Massachusetts

Client Name: Click to enter client name.
Case Manager: Click to enter VRC.
MRCIS#: Click to enter MRCIS number.
Date of Note: Click here to enter a date.
Type of Note: Choose an item.
Hours this Period: Enter hours.
Training Dates this Month: Click here to enter allconsult dates this month.

Client accepted delivery of equipment on: Click here to enter date(s) received.

1.) AT Training Outcome Goal: Enter SMART goal: Specific, Measurable, Attainable, Realistic with a Time frame.
1st visit this month- Goal Attainment Scale* Score: Choose an item.
2nd visit this month- Goal Attainment Scale* Score: Choose an item.
3rd visit this month- Goal Attainment Scale* Score: Choose an item.
4th visit this month- Goal Attainment Scale* Score: Choose an item.

2.) AT Training Outcome Goal: Enter SMART goal: Specific, Measurable, Attainable, Realistic with a Time frame.
1st visit this month- Goal Attainment Scale* Score: Choose an item.
2nd visit this month- Goal Attainment Scale* Score: Choose an item.
3rd visit this month- Goal Attainment Scale* Score: Choose an item.
4th visit this month- Goal Attainment Scale* Score: Choose an item.

3.) AT Training Outcome Goal: Enter SMART goal: Specific, Measurable, Attainable, Realistic with a Time frame.
1st visit this month- Goal Attainment Scale* Score: Choose an item.
2nd visit this month- Goal Attainment Scale* Score: Choose an item.
3rd visit this month- Goal Attainment Scale* Score: Choose an item.
4th visit this month- Goal Attainment Scale* Score: Choose an item.

Monthly summary on Assistive Technology training goals and progress toward vocational goal:
Click here to enter 2-3 sentences summarizing your sessions during this period.

The client has Enter Hours hours of training remaining.
Recommendation: Choose an item.
Click to enter details about the above recommendation, i.e. recommended equipment and justification, reason for discharge, how many additional hours you are recommending**, changes in AT training goals, etc.**

Specialist: Click to enter AT Specialist Name & Credentials
Click to enter AT Specialist contact info (phone number, email address)
If requesting additional equipment, indicate in the FILE NAME and BODY OF EMAIL to ATReports so it can be addressed quickly.

*The *Goal Attainment Scale* is a client centered collaborative and flexible measure that can help determine if a desired outcome has been met. A score of "0" means that the client was successful in meeting their goal. A score of +1 means that the client has exceeded their goal, and is likely in only 15–20% of individuals. A score of +2 means that the client far exceeded their goal, and is likely in only 5–10% of individuals.

APPENDIX F: Revised Monthly Progress Note Completed

Massachusetts Rehabilitation Commission Vocational Rehabilitation
Assistive Technology Consultation Monthly Progress Note
Easter Seals Massachusetts

Client Name: John Smith
MRCIS#: 8675309
Type of Note: Training Update
Case Manager: Jane Jones
Date of Note: 7/8/2016
Setup/Training Hours this Period: 5
Training Dates this Month: 6/6/2016 (client not home for scheduled appointment), 6/11/16, 6/18/16

Client accepted delivery of equipment on: 1/11/2016

1.) AT Training Outcome Goal: Client will demonstrate procedures to operate, maintain and perform simple troubleshooting with laptop computer without cueing by discharge. 1st visit this month- Goal Attainment Scale* Score: * Did not work on this equipment this visit. 2nd visit this month- Goal Attainment Scale* Score: * Setup/installation only 3rd visit this month- Goal Attainment Scale* Score: -1: LESS than expected outcome 4th visit this month- Goal Attainment Scale* Score: Choose an item.
2.) AT Training Outcome Goal: Client will utilize speech recognition for dictating email response with >95% accuracy by discharge. 1st visit this month- Goal Attainment Scale* Score: * Did not work on this equipment this visit. 2nd visit this month- Goal Attainment Scale* Score: * Setup/installation only 3rd visit this month- Goal Attainment Scale* Score: -2: MUCH LESS than expected outcome 4th visit this month- Goal Attainment Scale* Score: Choose an item.
3.) AT Training Outcome Goal: Client will utilize visual, auditory and vibratory prompts on smartphone to maintain commitments and appointments without assistance by discharge. 1st visit this month- Goal Attainment Scale* Score: * Did not work on this equipment this visit. 2nd visit this month- Goal Attainment Scale* Score: * Did not work on this equipment this visit. 3rd visit this month- Goal Attainment Scale* Score: -2: MUCH LESS than expected outcome 4th visit this month- Goal Attainment Scale* Score: Choose an item.

Monthly summary on Assistive Technology training goals and progress toward vocational goal: Client was not home for scheduled appointment on 1/06/2016. Rescheduled and met with client on 1/11/2016 to deliver and complete setup/installation of equipment. Initiated AT training during 1/18 visit with emphasis on speech recognition and using AT for time management. Client limited by environmental distractions and decreased attention to task, but demonstrated understanding of skills during training session.

The client has 7 hours of training remaining.
Recommendation: We recommend continued training with above hours.
Client making good gains toward AT training goals.

Specialist: Kevin Berner
Assistive Technology Specialist, Easter Seals Massachusetts
Email: kberner@eastersealsma.org| phone: (617) 226-2859

*The *Goal Attainment Scale* is a client centered collaborative and flexible measure that can help determine if a desired outcome has been met. A score of "0" means that the client was successful in meeting their goal. A score of +1 means that the client has exceeded their goal, and is likely in only 15–20% of individuals. A score of +2 means that the client far exceeded their goal, and is likely in only 5–10% of individuals.

APPENDIX G: Peer Review Feedback Form

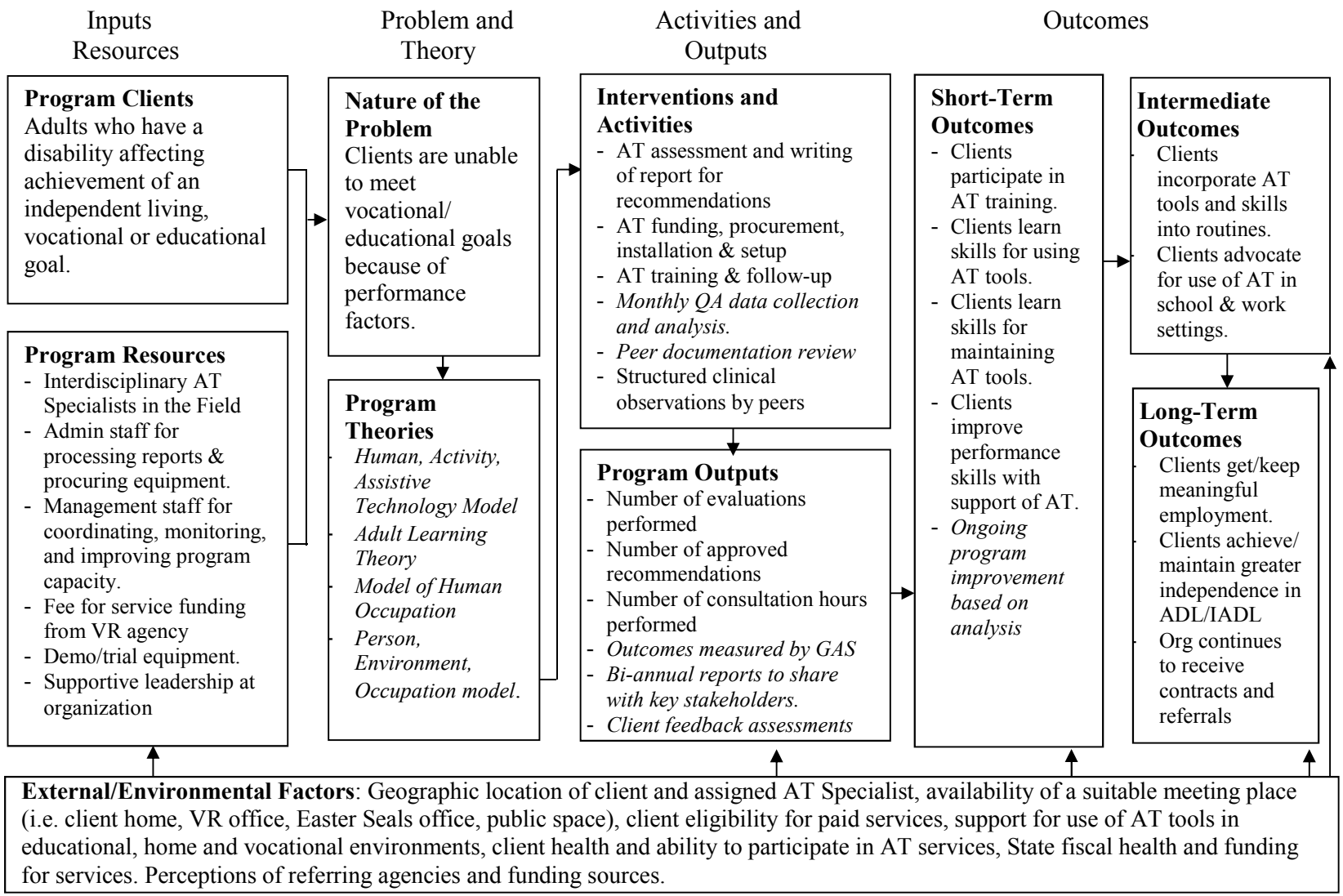
Report number: Click here to enter text. **Review Date:** Click here to enter a date.

Evaluation Review(place an X in applicable box)	**Meets standards**	**Doesn't meet standards**	**n/a**
Report is written within 10 working days of assessment date?			
Background section includes medical/function history, goals, and purpose of assessment?			
Functional status section discusses physical, cognitive, vision/perceptual, & hearing status?			
Functional limitations section clearly outlines client's areas of difficulty?			
Functional limitations section clearly outlines how AT will compensate for deficits?			
Functional limitations section contains alternate equipment that was considered?			
Recommended equipment section contains all equipment recommended in *functional limitations* section?			
Recommended equipment section contains links for atypical equipment?			
Recommendation summary section contains number of recommended training hours?			
Heading, filename, and report format are correct and consistent?			
Report contains evaluator name/credentials?			
Report is clearly written?			
Report is free of spelling or grammar errors?			

Monthly Training Note Review(place an X in applicable box)	**Meets standards**	**Doesn't meet standards**	**n/a**
Note is written within 7 days of the end of the previous month?			
Objectives are Specific, Measureable, Attainable, Realistic with a Time frame			
Number of training dates matches number of *Goal Attainment Scale* ratings used			
Type of Note, heading & filename consistent with report?			
Describes progress toward vocational and training goals?			
Equipment and hours requests are clearly labeled and well supported?			
Report contains evaluator name/credentials?			
Report is clearly written?			
Report if free of spelling or grammar errors?			
The file name contains the client's name, the contract, type of note and month/year of service (i.e. Adams_John_MRC_equiprequest_0316.docx)			

Comments:
Click here to enter text.

APPENDIX H: Outcomes of Assistive Technology Services in a Community-Based Organization (Logic Model)



APPENDIX I: Fact Sheet

BOSTON UNIVERSITY

Outcomes of Assistive Technology Services in a Community Based Organization

Kevin Berner, MS, OTR/L, ATP
OTD Candidate

What is Assistive Technology (AT)?

AT is defined as "*any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain, or improve functional capabilities of individuals with disabilities*" (Assistive Technology Act Amendments, 2004). The field of AT is supported by **multiple professions**, and AT services may be delivered in a **variety of settings and contexts** (Cook & Polgar, 2015).

What is the problem?

The AT literature has a **lack of quality evidence** related to best practices for assessment, intervention and outcomes measurement (Antilla, etal., 2012). This project sought to develop a **comprehensive service delivery and outcome measurement system that is grounded in theory and informed by the best available evidence to enhance an existing AT consultation program** at a community based non-profit organization.

This community based non-profit organization employs 17 AT Specialists with a variety of professional backgrounds, and provides 1-on-1 AT consultation to individuals with disabilities to improve independence and success in education, employment, and independent living domains.

How do AT devices and services help an individual with a disability?

Case Study: Rachel sustained a traumatic brain injury (TBI) three years ago and hopes to return to college. Rachel may experience several obstacles as a result of her injury. An AT specialist may perform:

- ✓ *Assessment:*
  A comprehensive AT assessment can **develop an understanding of the client**, identify **meaningful roles and activities**, and **interpret the contexts** in which these activities must be performed. The assessment reveals that Rachel experiences difficulty attending to the instructor in class, typing responses for her online discussion group, and keeping track of assignments.
- ✓ *Recommendations:*
  The AT specialist may **suggest assistive technology devices and services**, such as customization, installation and training. A report may be written to justify the recommended AT devices and services. For Rachel, the AT specialist may recommend a digital voice recorder for lectures, speech recognition software for typing compositions, and smart phone apps to keep track of assignments.
- ✓ *Installation and training:*
  The assistive technology specialist may help Rachel **configure her devices**, and **perform training** in the environments where she will need to perform her work.
- ✓ *Follow up:*
  The AT specialist will determine, through **outcomes measurement**, if the AT is helping Rachel **fulfill her student roles**. Adjustments may be suggested, such as additional training, trial of alternative devices, or modification of devices.

What does the evidence literature suggest?

A methodical and comprehensive review of the literature revealed the following themes:

- **Active engagement of clients in the AT assessment process leads to better outcomes** (Johnston, et al., 2014; Scherer, et al., 2005)
- **A natural context has advantages over a clinic for AT assessment and intervention** (Burke, et al., 2013; Gentry, 2008; Gentry, et al., 2015; Harvey, et al., 2013; Raghavendra, et al., 2013)
- **Use of an electronic cognitive aid can be effective for recalling events and tasks for individuals with cognitive impairment** (Gentry, 2008; Gentry, et al., 2015)
- **Synthesized text-to-speech screen reading software can improve reading rate for individuals with learning disabilities** (Floyd and Judge, 2012) **and for adults with brain injury** (Harvey, et al., 2013)
- **The Goal Attainment Scale (GAS) is a reliable, valid, and sensitive tool for assessing the achievement of goals** (Hurn, et al., 2006)
- **AT and AT services are difficult to study because AT users and contexts vary greatly** (Antilla, etal., 2012), **and technology is constantly changing** (Andrich, et al., 2013)

How will these findings influence the existing AT Program?

The following will be included in the current AT consultation program:

- **Enhanced analysis of program data, by the clinical supervisor and administrative assistant to ensure high quality of service**
- **Anonymous peer review of documentation on a quarterly basis**
- **Structured clinical observations by peers on an annual basis**
- **Collection of outcomes related to achieving client centered goals using the GAS**
- **Collection and analysis of client feedback through an anonymous online survey**
- **Bi-monthly virtual journal club to review and process current research with interprofessional field staff**
- **Bi-annual reports to key stakeholders highlighting program outputs, including number of approved recommendation reports, results of feedback surveys, and analysis of GAS data**

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APPENDIX J: Executive Summary

Outcomes of Assistive Technology Services in a Community Based Organization

Introduction

Assistive technology (AT) is defined as "any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (Assistive Technology Act Amendments, 2004). The field of AT and AT services is dynamic and supported by multiple professions; and may be delivered in a variety of settings and contexts (Cook & Polgar, 2015). While this shared stake in the field of AT provides a variety of unique perspectives, it creates a challenge in regards to uniformity when delivering and measuring the effectiveness and impact of services. This project titled, *Outcomes of Assistive Technology Services in a Community Based Organization*, will seek to enhance an existing AT consultation program's service delivery and outcome measurement system using the best available evidence. The current program primarily assists adults with disabilities select and utilize assistive technologies to meet vocational, educational, and independent living needs in their home, work and school environments.

The literature related to assistive technology intervention has been described as lacking rigor due to its numerous practice areas, multiple service delivery contexts, varied practitioner theoretical perspectives, and funding challenges (Smith, 1996; Lenker & Paquet, 2004; Martin, et al., 2008; Anttila, et al., 2012; Thomas, et al., 2015). Due to technology advances and changing societal roles and perceptions, outcomes for assistive technology can be considered "moving targets" that change frequently over time, making

it difficult to standardize in studies (Andrich, et al., 2013; Antilla, et al., 2012). A review of the literature was conducted to select the best available evidence to inform the development of an AT consulting program. Specifically, the focus of the review of the evidence literature was to determine evidence based intervention strategies, and best practice for evaluation procedures, outcome measurement, and program evaluation.

Theoretical Frames of Reference:

Several theoretical frameworks, including the Model of Human Occupation (MOHO) (Kielhofner, 2009), the Person Environment Occupation (PEO) model (Law, et al., 1996), the Human, Activity, Assistive Technology (HAAT) model (Cook & Polgar, 2015), and the Adult Learning Theory (Knowles, Holton and Swanson, 1998) were considered as a basis for structuring the program. Although the MOHO and PEO models provide a solid theoretical foundation for the AT services provided through the existing program, these models utilize biases, concepts, and terminology that are greatly influenced by an occupation-based occupational therapy (OT) approach (Kielhofner, 2009: Law et al., 1996). It is important to utilize theoretical models that can be understood and appreciated by the special educators, speech and language pathologists, rehabilitation counselors, technologists, and rehabilitation engineers on staff. The HAAT model is an interdisciplinary practice model that emphasizes the close and dynamic interaction between the human and their client factors, a meaningful activity and its task demands, the assistive technology tools selected and the influence of the context (Cook & Polgar, 2015). The HAAT Model has similar components to other ecological models such as the PEO model and MOHO theory, as they all consider the influence of multiple

factors on occupational performance (Cook & Polgar, 2015). Once the appropriate assistive technology and environmental supports are identified and put into place, the individual must be trained in strategies and skills for effectively utilizing the assistive technology (Cook & Polgar, 2015). Adult learning theory describes a set of core values that are necessary when attempting to facilitate learning for an adult population (Knowles et al., 1998).

Assessments and Outcome Measures:

Several structured assessments have been published to assist with the appropriate selection of assistive technologies for specific populations, including the Matching Person and Technology (MPT) Scale (Scherer, 2007), the Functional Evaluation for Assistive Technology (FEAT) (Raskind & Bryant, 2002), the Student Environment, Task and Tools (SETT) Framework (Zabala, 1995), and the Wisconsin Assistive Technology Initiative (WATI) Assistive Technology Assessment (Gierach, 2009). Three of the four comprehensive assistive technology assessments found, the FEAT, the SETT Framework and the WATI Assessment, focus exclusively on assessing for assistive technology in learning environments and would not be appropriate for the majority of clients serviced by the current program (Raskind & Bryant, 2002; Zabala, 1995; Gierach, 2009). No measures were found to be sufficient for gathering all of the information that is necessary to make informed choices about assistive technology, and to gather necessary information required to justify provision of assistive technology devices and consultation to payers. A custom interview and assessment protocol will be developed by this author incorporating relevant age appropriate, task appropriate and context appropriate topics

and queries from existing assessments such as the MPT and FEAT (Scherer, 2007; Raskind & Bryant, 2002).

Outcomes collection and analysis is necessary to determine efficacy of services provided. An ideal outcome measure will be client-centered, valid, reliable, easy to administer, and flexible to meet the needs of diverse clients who have a variety of goals and contexts. A search of the literature revealed that the Canadian Occupational Performance Measure (COPM) and the Goal Attainment Scale (GAS) possess these qualities (Law, et al., 2004; Kiresuk, & Sherman, 1968). The authors warn that interdisciplinary use of the COPM may extend the measure outside of the occupational performance domain, and the measure may no longer possess the published validity and reliability qualities (Law et.al. 2015). For non-OT assistive technology specialists, extensive training and mock-assessments will be required, and may not lead to acceptable consistency and reliability in assessment performance. The GAS is a versatile outcome measure that may meet the diverse objectives and characteristics of the clients served by the program, and can be used by practitioners of all professional backgrounds (Hurn, et al., 2006). This assessment can be initiated during the evaluation process, achievement of goals can be reassessed monthly while participating in training, and final assessment can be determined at discharge. A new monthly progress note template incorporating the GAS will be created and staff will be trained in its use.

Best Practices for Intervention:

Several themes emerged in the evidence literature as best practices such as that community-based assistive technology assessment and training enhances outcomes

(Sohlberg et al., 2005; Raghavendra, et al., 2013); and that a client-centered practice that integrates the assistive technology user in the decision-making process can lead to higher satisfaction and reduced technology abandonment (Lenker, & Paquet, 2004; Johnston, et al., 2014; Scherer, et al., 2005). In the current program, consultations are always client-centered and performed at the client's home, school or work environment. We will continue to work with clients in the community, and engage them in the assessment and decision-making process by using collaborative assessment tools, outcome measurement processes, and training interventions.

There is support in the literature for the use of several assistive technologies. Evidence exists for utilizing cognitive aids for daily living for individuals with executive function impairments associated with Autism Spectrum Disorder (Gentry, et al., 2010; Gentry, et al., 2015) and individuals with cognitive impairment from progressive and chronic neurological conditions (Gentry, 2008; LoPresti, et al., 2008; Lindqvist, et al., 2015). Some evidence suggests that synthesized text to speech assistive technologies can improve reading rate for individuals with learning disabilities (Floyd and Judge, 2012) and adults with brain injury (Harvey, et al., 2013a; Harvey, et al., 2013b). However, the literature was inconclusive for its effect on reading comprehension since the studies were limited by small sample size and high variability among participants. These technologies will be regarded as evidence supported practice options for practitioners (Floyd and Judge, 2012; Harvey, et al., 2013a; Harvey, et al., 2013b).

Peer-led initiatives such as journal clubs and team evidence searches have been reported to improve practitioner evidence-based practice capacity in school settings

(Cahill, Egan, Wallingford, Huber-Lee, & Dess-McGuire, 2015); and for interprofessional teams in multiple settings (Novak & McIntyre, 2010). A journal club will be established that will meet monthly to select, critically appraise, and discuss the peer-reviewed research article about assistive technology assessment and intervention.

By enhancing program monitoring, the assistive technology consultation program will be more effective in meeting its objectives. Data on whether clients are seen and reports are written within the expected timeframe will assist in managing caseloads, determining staffing needs, and identifying areas where additional training is necessary. By developing a protocol in which these outcomes are monitored on a routine basis, organizational leadership will be aware of potential deficiencies in meeting benchmark expectations before it becomes an issue with referring agencies. This data will be shared with organizational leadership, and can be shared with field staff, the referring agency, and potential donors.

Funding Plan:

The existing program is completely funded by competitive contracts and consulting fees. Several initiatives recommended by this Executive Summary will require support beyond the current operation costs. These costs include staff salaries to cover training in the use of the GAS, administrative assistant salary costs associated with an enhanced outcome tracking method, and clinical field staff salaries to support participation in new initiatives such as the monthly journal club. Cost will also be considered for dissemination activities, such as article submissions and conference presentation proposals. It is likely that the expenses anticipated from implementation of

the proposed program will receive funding from a variety of sources, including consulting fees and the existing operating budget, public grants, and from private individual and organization donors.

Conclusion:

This project aims to develop a model using the best available evidence by which community based organizations can structure their assistive technology assessment procedures, interventions, and outcomes measurement. If outcomes that are collected and analyzed are meaningful, a second phase of dissemination will occur for secondary audiences. There is a potential for global impact outside of the current organization as a result of this project. Outcomes inform administrators, legislators, practitioners and members of the public for making referral, program development, and funding decisions (Smith, 1996; Newcomer, et al., 2010; Mendelsohn, et al., 2008). *Outcomes of assistive technology services in a community based organization* may be able to contribute to the body of knowledge informing assistive technology practitioners, funding sources and AT users.

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CURRICULUM VITAE

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EDUCATION

Boston University, Sargent College of Health and Rehabilitation Sciences **Boston, MA**

- Post Professional Doctorate in Occupational Therapy, September 2016
- Master of Science in Occupational Therapy, January 2005
- Bachelor of Science in Human Physiology with a minor in Psychology, May 1999

OCCUPATIONAL EXPERIENCE & CLINICAL COMPETENCE

Assistive Technology Clinical Supervisor December 2014 – present
Easter Seals Massachusetts, Worcester MA

- Lead diverse team of Assistive Technology Professionals
- Perform assessments, installation, customization and training in the use of Assistive Technology to meet client goals
- Screen and manage referrals to state funded Independent Living Assistive Technology program
- Improve capacity and quality of service through staff development

Adjunct Lecturer *September 2009 – present*
Department of Occupational Therapy, Boston University, Boston, MA

- Primary instructor for two required courses in masters of science in occupational therapy program
- Facilitate hands-on lab in graduate level assistive technology course
- Coordinate interdisciplinary content experts and guest lecturers to enhance the student experience
- Provide written feedback for student assignments
- Design and advise interprofessional Assistive Technology independent study experience with local university

Per Diem Occupational Therapist:
Braintree Rehabilitation Hospital, Braintree, MA *April 2008 – present*
The Boston Home, Dorchester MA *December 2012–present*

- Perform evaluations and implement treatment plans in neurobehavioral physical rehabilitation setting
- Mentor clinical staff to develop skills for assistive technology assessment, implementation and training

Assistive Technology Specialist *November 2012 – December 2014*
Easter Seals Massachusetts, Worcester MA

- Determine appropriate technology to assist individuals with disabilities to meet their vocational, educational and independent living goals in the home and at work
- Perform ergonomic assessments to optimize performance and prevent musculoskeletal injury
- Fabricate custom adaptations to improve access to assistive devices
- Develop and execute training protocols for utilizing assistive technologies
- Create and deliver training seminars and workshops for professional and lay audiences

Occupational Therapist *April 2009 – November 2012*
The Boston Home, Dorchester, MA

- Evaluate and treat adults in advanced stages of progressive neurological conditions in long term care setting
- Guide rehabilitation aides in assisting residents in performing home exercise and rehabilitation programs
- Perform assistive technology assessments and training for individuals with a variety of client factors including low vision, perceptual impairments, upper extremity function impairments, and cognitive impairments
- Mentor volunteer and fellowship resources in providing assistive technology support
- Provide staff education on assistive technology setup and positioning device use for specific residents

Occupational Therapist II *April 2008 – March 2009*
Massachusetts Hospital School, Canton, MA

- Directly supervise COTA, rehabilitation aide and OT graduate interns as well as provide mentorship to OTR
- Evaluate and treat children and young adults with neurological conditions in the clinic, residence, and classroom
- Collaborate with clinical and education staff for assistive technology evaluation to optimize access to educational curriculum and participation in personal care
- Initiate positive reinforcement programs to enhance participation and build skills in personal care and mobility during ADL/IADL
- Educate staff and monitor compliance with medical and therapy feeding recommendations on an interdisciplinary dysphagia team

Occupational Therapist *January 2005 – April 2008*
Braintree Rehabilitation Hospital, Braintree, MA

- Perform evaluations and implement treatment plans in neurobehavioral physical rehabilitation setting
- Lead team to integrate upper extremity robotics and functional electrical stimulation program
- Lead team of therapists to integrate research protocol for a blinded clinical trial
- Supervise and mentor full time graduate-level occupational therapy interns
- Participate in task force to prepare for specialty brain injury certification
- Perform seating assessments and produce letters of medical necessity in outpatient wheelchair clinic

Pediatric Occupational Therapy Intern *September 2004 – December 2004*
Children's Hospital of New Orleans, New Orleans, LA

Physical Rehabilitation Occupational Therapy Intern *June 2004 – September 2004*
Braintree Rehabilitation Hospital, Braintree, MA

- Perform functional evaluations and develop rehabilitation treatment plans to promote participation in meaningful occupation and meeting of developmental milestones under supervision
- Introduce assistive technology to assist in remediation and compensation of disability
- Produce medical equipment justification letters and submit billing to third party payers

Course Instructor and Student Advisor *December 1999 – June 2004*
Boston University Center for Psychiatric Rehabilitation, Boston, MA

- Develop curricula and instruct classes focusing on life skills, computer competency, and Internet use in a community-based program for adults with psychiatric disabilities
- Supervise and mentor classroom assistants and new staff
- Perform individualized academic advising to support participation in program and career development
- Collaborate with a multidisciplinary team in program development

Website Administrator *December 1998 – June 2004*
Boston University Rehabilitation Research and Training Center on Psych Disability, Boston, MA

- Create and maintain a 700+ page Internet site for an internationally recognized mental health organization
- Assist in participant recruitment, data collection, and data analysis for NIDRR funded research projects
- Work with team to execute and analyze an Internet-based marketing and dissemination strategy
- Assist in design and launch of an Internet-based professional development distance-learning program

Freelance Website Developer and Consultant *February 1998– January 2009*

- Establish an Internet presence for small businesses and non-profit organizations
- Develop customized staff training programs for website maintenance and development

PRESENTATIONS

Berner, K. *Capstone Presentation: Outcomes of assistive technology services in a community based organization*. Boston University College of Rehabilitation Sciences, Sargent College, Boston MA (August 29, 2016).

Berner, K. *Apps for success at work*. Partners for Youth with Disabilities: Youth Leadership Forum, Bridgewater State University, Bridgewater, MA. (July 15, 2016).

Berner, K. & Mahoney, P. *Enabling professional opportunity and development with assistive technologies.* Assistive Technology Industry Association (ATIA) 2016 Annual Conference, Orlando, FL (February 4, 2016).

Invited Speakers: Berner, K. & Mallozzi, A. *Keynote address: How Assistive Technology Improves Independence for Individuals with Disabilities*. Easter Seals Massachusetts Regional Board's Connect for a Cause, Cambridge, MA (November 5, 2015).

Invited Presenter: Kiran, S., Ellis, T., Guenther, F. & Berner, K. *Panel Discussion: How Technology is Changing Rehabilitation*. Health Matters Virtual Conference, Boston University College of Rehabilitation Sciences, Sargent College, Boston MA (September 17, 2015)

Invited Presenters: Oddleifson, E, Peak-Oliveira, K., & Berner, K. *Assistive Technology to Help People Live, Learn, Work and Play.* MassMutual Technology Center, Springfield, MA. (September 3, 2015)

Invited Presenter: Berner, K. *How do OTs Think: Occupational Therapy and the Assistive Technology Process*. Principals and Practice in Assistive Technology, Massachusetts Institute of Technology, Cambridge, MA. (September 29, 2014)

Bendix, K, Berner, K, Aaronson, M. & Troy, L. *Pressure relief, propulsion, power and advanced skills for the physical therapist*. Northeastern University, Boston MA. (August 12, 2014)

Invited Presenter: Berner, K. *Computer workstation ergonomics for the modern computer user: Preventing injury and accommodating for disability*. Assistive Technology Expo Summer 2014, Holyoke, MA. (August 6, 2014)

Invited Presenter: Berner, K. *Yes you can: options for controlling your world*. Assistive Technology Expo Summer 2014, Holyoke, MA. (August 6, 2014).

Bendix, K & Berner, K. *Seating assessment for physical therapist, lab instruction*. Northeastern University, Boston MA. (August 5, 2014)

Berner, K. *Navigation apps for orienting and connecting with your community*. Easter Seals Youth Leadership Forum, Bridgewater State University, Bridgewater, MA. (July 15, 2014)

Berner, K. *Accessibility & I-Devices: Assisting people with diverse abilities to engage in meaningful occupation*. OccupationalTherapy.com webinar. (April 16, 2014)

Invited Presenter: Kiran, S., Ellis, T., & Berner, K. *Interprofessional Rounds: Utilizing technology in rehabilitation*. Boston University College of Rehabilitation Sciences, Sargent College, Boston MA (March 27, 2014)

Berner, K. *Accessibility & I-Devices*. Easter Seals Professional Workshop Series, Boston MA (March 11, 2014)

Invited Presenter: Berner, K. *Assistive technology for adults with neurologic disability.* OccupationalTherapy.com webinar. (January 8, 2014).

Invited presentation: Berner, K., *Determining access for electronic devices*. Association of Developmental Disability Specialists Technology Day, Worcester MA (June 6, 2013).

Invited presentation: Berner, K., *Yes you can! Options for controlling your world*. Easter Seals Massachusetts Assistive Technology Expo, Worcester MA (June 3, 2013).

Invited presentation: Berner, K., *Computer workstation ergonomics for the modern computer user: Preventing injury and accommodating for disability*. Easter Seals Massachusetts Assistive Technology Expo, Worcester MA (June 3, 2013).

Berner, K., *Practical application of assistive technology across the continuum of care.* Annual Conference for the Massachusetts Association for Occupational Therapy, Norwood MA (October 26, 2012)

Berner, K. & Burnham, A. *Designing, adapting, and implementing assistive technology for adults with progressive neurological disorders,* Braintree Rehabilitation Hospital's Annual Neurorehabilitation Conference, Cambridge MA (November 3, 2012).

Berner, K. *Practical application of assistive technology in neurological rehabilitation.* Braintree Rehabilitation Hospital, Braintree, MA (June 29, 2011).

Berner, K. *Upper extremity rehabilitation technologies and occupation.* Boston University Sargent College of Health and Rehabilitation Sciences, Boston MA (April 20, 2011).

Berner, K. *Evaluating executive function: the Kitchen Task Assessment-Modified and the Executive Function Performance Test.* Massachusetts Hospital School Department of Occupational Therapy, Canton, MA (December 8, 2008).

Berner, K. & Templeton, O. *Cognition and occupation*. Department of Occupational Therapy, Boston University, Boston, MA (October 6, 2008)

Berner, K. & Nichols, M. *Upper extremity neurological re-education*. Braintree Rehabilitation Hospital, Braintree, MA (February 12, 2008).

Berner, K. *The Braintree Scoop: Upper extremity robotics in neurological rehabilitation*. Braintree Rehabilitation Hospital, Braintree, MA (February 8, 2008).

Berner, K. & D'Angelo, L. *Technology in neurological rehabilitation*. Aphasia Support Group, Braintree Rehabilitation Hospital, Braintree, MA (December 19, 2007).

Berner, K. & Sharkey, S. *Cognition and occupation*. Department of Occupational Therapy, Boston University, Boston, MA (October 5, 2007).

Berner, K. *Perceptual deficits: Case presentation and intervention demonstration*. Boston University Occupational Therapy lab session, Braintree, MA (November 16, 2006).

Berner, K. & Sharkey, S. *Cognition and occupation*. Department of Occupational Therapy, Boston University, Boston, MA (September 28, 2006).

Berner, K. & Nichols, M. *Kitchen Task Assessment-Modified: Objectively measuring cooking tasks.* Braintree Rehabilitation Hospital, Braintree, MA (March 14, 2005).

Nichols M. & Berner, K. *Bioness H200 implementation & use at Braintree Rehabilitation Hospital.* Braintree Rehabilitation Hospital, Braintree, MA (January 12, 2005).

Nichols M. & Berner, K. *Application and clinical demonstration of Bioness H200.* Braintree Rehabilitation Hospital, Braintree, MA (January 26, 2005).

Berner, K. *Challenge activities & outdoors adventure groups: Relevance for persons served at Children's Hospital of New Orleans*. Children's Hospital Occupational Therapy Department, New Orleans, LA (December 9, 2004).

Berner, K. *Case study: E.B.*. Braintree Rehabilitation Hospital, 2 South, Braintree, MA (September 9, 2004).

Berner, K. *Literature review: IADL assessments*. Braintree Rehabilitation Hospital 2 South Occupational Therapy Department, Braintree, MA (September 1, 2004).

Berner, K. *Academic poster presentation: Challenge activities and groups*. Sargent College of Health and Rehabilitation Sciences, Boston, MA (November 22, 2002).

Berner, K. & Wilbur, D. *Internet training for persons with psychiatric disability*. 2nd Annual Conference for the Massachusetts Chapter of the International Association of Psychosocial Rehabilitation Services, Worcester, MA (September 18, 2002).

Berner, K. *Internet training for persons with psychiatric disability*. 27th Annual Conference for the International Association of Psychosocial Rehabilitation Services, Toronto, Canada (June 12, 2002).

Hamilton, K. & Berner, K. *Rehabilitation and recovery services at the Center for Psychiatric Rehabilitation.* Boston University Occupational Therapy Department, Boston, MA (December 4, 2001).

Berner, K. & McNamara, S. *Professional development trainings using the Internet.* Center for Psychiatric Rehabilitation General Staff Meeting, Boston, MA (October 4, 2000).

Invited Presenter: Berner, K. *Reaching our stakeholders using the World Wide Web: A presentation of innovative RRTC web sites.* 22nd Annual National Association of Rehabilitation Research and Training Centers (NARRTC) Conference, Washington, DC (May 7, 2000).

PUBLICATIONS & RESEARCH COMPETENCE

Berner, K. (2014, September 22) *Unable to type, comedian with multiple sclerosis connects with his voice* [Blog post], Retrieved from: http://whatsnext.nuance.com/office-productivity/comedian-with-multiple-sclerosis-connects-with-dragon-naturallyspeaking/

Berner, K. (2004). *The relation between applied cognitive function and performance of ADL/IADL for persons receiving rehabilitation.* Unpublished master's thesis, Boston University, Boston.

Jacobs, K., Berner, K., DeGroat, E., Eisenstein, M., Finn, K., Guberman, C., Hasseline, K., Hladky, C., Lockhart, R., Josephson, R., McCloy, A., Nemet, C., Patterson, E., & Trieu, L. (2003). Everything You Should Know About Assistive Technology and The Aging Worker, But Were Afraid to Ask! *OT Practice, 8*, 12–17.

Berner, K. & Jacobs, K. (2002). The gap between exposure and implementation of computer workstation ergonomics in the workplace. *Work, 19,* 193–199.

Berner, K. (2002). *Introduction to Website Design Online Course Materials*. [Online] http://www.bu/edu/cpr/classes/webdesign/

Berner, K. (2001). *Introduction to the Internet Online Course Materials*. [Online] http://www.bu/edu/cpr/classes/internet/

VOLUNTEER AND COMMUNITY INVOLVEMENT

- *Walk MS member of The Boston Home Walk Team,* Boston MA (April 10, 2011)
- *JWT Memorial Bike/Run/Walk for the Angel Fund*, Tiverton, RI, Event Volunteer (July 10, 2010)
- *St Jude's Children's Research Hospital Event Volunteer: Big Dreams Start Small,* Boston, MA (April 8, 2006 and September 29, 2007)
- *Outdoor Explorations*, Medford MA; Adventure Volunteer (April 2003–January 2007)
- *Adaptive Physical Education Group at the Oak Square YMCA*, Brighton, MA; Volunteer Group Co-Leader (January 2004 – April 2004)

CERTIFICATIONS, AFFILIATIONS & AWARDS

- Licensed Occupational Therapist, Massachusetts (lic # 8989)
- Registered Occupational Therapist, National Board of Certification of Occupational Therapists (reg # 1074443)
- Certified Assistive Technology Practitioner (ATP), Rehabilitation Engineering and Assistive Technology Society of North America (RESNA)
- American Occupational Therapy Association member (2000–present)
- Rehabilitation Engineering and Assistive Technology Society of North America (2013–present)
- CPR Basic Life Support Certified, American Heart Association (expires May 2017)
- Certified Trainer, Safety Care Behavioral Safety Training (expires May, 2016)
- Employee Spirit Award, Easter Seals Massachusetts, 2013
- Certificate of Appreciation Award, New England Occupational Therapy Education Council, 2012
- Florence G. Hunter Award, Boston University Occupational Therapy Department, 2004

**Professional references available upon request*